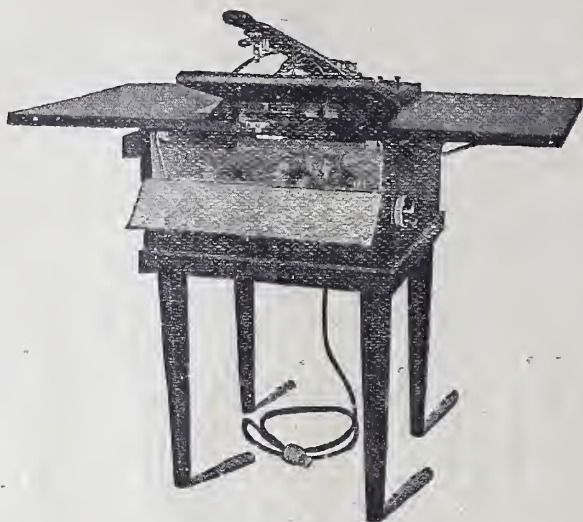


Vol. 57. No. 9 September 1920 20 Cents

The
Photographic
Journal
of America

Published Monthly
With Illustrations



Efficiency in the Printing Room

can never be obtained with make-shift or antiquated equipment. A reliable, scientifically correct, modern printing machine is essential in the production of work of highest quality.

The Ansco 11 x 14 Professional Printing Machine is designed for general use. It is easy to install, economical to maintain and uniformly dependable as to light.

PRICES and full description of this Printer and other Ansco professional apparatus for photographic studios will be mailed on request.

ANSCO COMPANY
BINGHAMTON, N. Y.

NEW YORK
129-131 West 22nd St.

SAN FRANCISCO
171-173 Second St.

CHICAGO
308 N. Michigan Blvd.

TORONTO
347 Adelaide St., W.



It's the film
that makes
the picture



No matter how beautiful the scene, how expensive the lens, how efficient the shutter, unless your film is *right*, complete success in taking pictures cannot be attained.

Ansco Speedex Film

excels in recording pictures faithfully and as rapidly as is demanded, at all seasons and in all climes.

It is the original and the perfect film. Adapted for use in any roll film camera.

Write for Ansco Speedex Film Booklet

Ansco Company
Binghamton, N. Y.

THE MOST ADVANCED TYPE OF SHUTTER

"Use an Ilex and avoid shutter trouble." Write today for our free catalog



IN THE PHOTOGRAPHIC WORLD

Showing the Famous Ilex Gear Combination for governing the slower and higher speeds

ILEX OPTICAL COMPANY, 781 Ilex Circle, ROCHESTER, N. Y.

Paget Self Toning Papers

WHITE AND BUFF STOCK

Direct or through dealers

8 x 10	Light weight	\$1.50
5 x 7	"	.65
4 x 6	"	.50
4 x 5	"	.40
3½ x 5½	"	.40
2½ x 4½	"	.25
2½ x 3½	"	.25
8 x 10	Heavy weight	1.65
5 x 7	"	.75
Post Cards		.50

The Paget Co.'s
VIGURA
Gaslight Paper

Very superior and most popular with the American Soldiers when in Europe

Send for List

WILLIS & CLEMENTS

1814 Chestnut St.
PHILADELPHIA

Wallace's "Metol"

Is a pure Mono Methyl Paramido Phenol Sulphate. Better than best imported

We are Actual Manufacturers—Not Mixers

On request we will send complimentary sample to professional photographers

Send Us the Name of Your Dealer

Special Materials Company, Inc.

Manufacturing Chemists

140 Livingston St., Brooklyn, N. Y., U. S. A.

AMERICAN
MADE

REXOLON

DEVELOPING
AGENT

Rexolon is a new universal developing agent. Rexolon offers unusual, distinctive and important advantages over all other developing agents.

1. Rexolon is chemically pure and lasting.
 2. Rexolon is distinctive for the non-oxidizing qualities. It will stand in an open solution twice as long as German metol
 3. Rexolon is non-poisonous to the skin, a characteristic which will appeal to all subject to metol poisoning.
 4. Rexolon is a soft developer, greater contrast can be obtained by the addition of bromide, which within certain limits does not affect the tone.
 5. Rexolon will produce good blacks and whites even if the negatives are under or over exposed.
- Rexolon is being rapidly stocked by all photo dealers. It will pay you to give a trial.

Put up in one, four and eight ounce bottles, also in one pound bottles.

One ounce bottle.....\$1.35

CHICAGO

=

Burke & James Inc

=

NEW YORK

Pictures with Mounted HIGGINS' PHOTO MOUNTER



Have an excellence peculiarly their own. The best results are only produced by the best methods and means—the best results in Photograph, Foster and other mounting can only be attained by using the best mounting paste—

HIGGINS' PHOTO MOUNTER
(Excellent novel brush with each jar)

At Dealers in Photo Supplies,
Artists' Materials and Stationery.

A 5-oz. jar prepaid by mail for 50c., or circulars free, from

CHAS. M. HIGGINS & CO., MFRS.
NEW YORK, CHICAGO, LONDON.

Main Office, 271 Ninth Street, } Brooklyn, N. Y.,
Factory, 244-245 Eighth Street, } U. S. A.

THE PHOTOGRAPHIC JOURNAL *of* AMERICA

REGISTERED IN THE UNITED STATES PATENT OFFICE

NEW SERIES: WILSON'S PHOTOGRAPHIC MAGAZINE

**AN ILLUSTRATED MONTHLY DEVOTED TO THE SCIENCE
AND ART OF PHOTOGRAPHY**

THE OLDEST PHOTOGRAPHIC MAGAZINE IN AMERICA

Founded 1864

Incorporating:

The Philadelphia Photographer

The Photographic World

THOMAS COKE WATKINS, Editor

CONTENTS FOR SEPTEMBER, 1920

Composition in Portraiture	"Professional"	335
Soft Focus Lenses—Their Use and Abuse	Flambeau	342
Expression and Likeness		346
Editor's Table—"Better Business"—On Having a Method—Discontent.		347
The Studio—Practical Papers on Studio Work and Methods		350
Abstracts and Translations	E. J. Wall, F.R.P.S.	354
Views and Reviews		356
The Workroom		359

YEARLY SUBSCRIPTION, in advance, postage paid, United States, Mexico, Cuba, Philippines and Porto Rico, \$2.00; Canada, \$2.35. Countries in the Postal Union, \$2.75. Single copies, 20 cents.

REMITTANCES may be made at our risk by money order, check, draft, or registered letter.

SUBSCRIPTIONS begin with current issue.

Published by EDWARD L. WILSON COMPANY, INC.,

THOS. C. WATKINS, President.

701 Arch Street, Philadelphia, Pa.

EXECUTIVE and EDITORIAL OFFICES, CAMERA BUILDING, 122 EAST 25th ST., NEW YORK CITY

HOUGHTON'S, Ltd., London, Eng., Agents for Great Britain

American News Co., Distributors for U. S.

Kodak Australasia Ltd., Sydney, Agents for Australia

RICHARD HILL, Devonport, Auckland, Agent for New Zealand

Entered at Philadelphia Post-office as Second-class Matter

This is one of a series of sketches on Leading American Photographers.

American Photographers



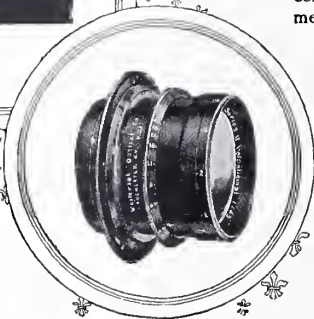
GEO. W. HARRIS:—In Washington, D. C., where great men get together, Geo. Harris, founder and manager of Harris & Ewing, has established a unique organization that is known the world over.

Without a doubt, George Harris makes portraits of more international celebrities than any man in the world. Presidents, congressmen, visiting regents and notables from the four corners of the earth, sit before his lens. As a member of the president's party to France, he made a remarkable collection of portraits of delegates to the peace conference.

Holding various offices in the P. A. of A. (including that of president) and lecturing and demonstrating on convention platforms, George Harris has willingly and helpfully served his fellow-craftsmen.

It has been our pleasure to supply Mr. Harris with all his lenses. In his studio, he uses the Vitax F:3.8 and Vento F:4; in his home portraiture and News Service, the Series II Velostigmat F:4.5.

When Geo. Harris attended the peace conference he took with him one lens, with which he photographed seventy-three delegates to the conference. This lens was the Series II Velostigmat F:4.5 shown here in Barrel.



WOLLENSAK OPTICAL CO.

ROCHESTER, NEW YORK.



\$100⁰⁰

DEPOSITED IN A NEW YORK BANK, WILL BE PAID THE EXPERT NEGATIVE RETOUCHER THAT CAN RETOUCH A NEGATIVE WITH A STIPPLED EFFECT, EQUAL IN FINENESS, SMOOTHNESS AND REGULARITY AS IS DONE BY THE

ARTOGRAPH

TRADE MARK.

SCREEN Pat. Pending

THE LATEST AND GREATEST LABOR-SAVING DEVICE.

For Professionals. :: For Amateurs.

NO Time—NO Skill Required.

IF YOU WANT TO SAVE MONEY AND PRODUCE SUPERIOR WORK

SEND FOR ONE TODAY!

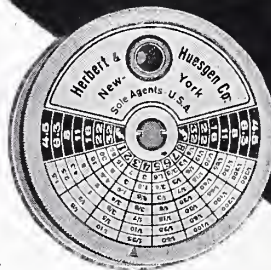
Endorsed by Sarony and other high-class photographers.

Sent on receipt of price: 5 x 7, \$3.50; 8 x 10, \$5.00

The Artograph Screen Co.

500 Fifth Avenue New York City

For Sample Photo send 15¢ in stamps



HEYDE'S ACTINO PHOTO-METER

Eliminates Guessing in Photography!!

The simplest, most effective and most accurate instrument for determining correct time for exposure. Easily and quickly manipulated; compact and always ready for use.

No Sensitive Paper Used For Tinting

Exposure table complete on dial.

Essential to the Photographer who wants perfect pictures.

Order by mail or from your dealer. Write for descriptive booklet.

HERBERT & HUESGEN CO.

18 East 42nd Street
NEAR 5TH AVE., NEW YORK.

New Vest Pocket Model

Size Dia. 2-3/8" x 13/16" Thick

Price \$10.

Dealers: A postal will bring our special offer.

Sent Complete with Combination Pink Films that Produce Results

A Perfect Combination

GOERZ

EVERY EXPERIENCED PHOTOGRAPHER admits the wonderful brilliancy, covering-power and definition of GOERZ LENSES. Likewise, no well-informed camerist needs to be told of the careful workmanship, service-ability and general excellence of GOERZ CAMERAS. A GOERZ CAMERA equipped with a GOERZ LENS is a perfect optical and photographic combination. An intelligent selection of the right model of camera and correct type of lens for the work in hand will ensure photographic success. We have had over twenty-five years of practical experience in making cameras and lenses—we know how to get results. Our Correspondence Department will help you gladly to make a wise selection. Call at your dealer's today or write us for our interesting and valuable descriptive matter.

C.P. GOERZ AMERICAN OPTICAL COMPANY
323 EAST 34TH STREET: NEW YORK CITY

HIGH SPEED *and* WIDE LATITUDE *of* EXPOSURE ENABLE HAMMER PLATES

to cope successfully with all conditions of light,
temperature and humidity

Their long-established record proves their worth

Hammer's Special Extra Fast (red label) and Extra Fast (blue label) Plates for field and studio work and Hammer's Extra Fast Orthochromatic and D. C. Orthochromatic Plates for color-values



Hammer's Little Book, "A Short Talk on Negative Making," mailed free

HAMMER :: DRY-PLATE :: COMPANY
Ohio Avenue and Miami Street St. Louis, Missouri

"A Manual full of good wholesome material and a valuable reference book for every member of the profession, big or little."

How to Make a Studio Pay

By Frank Farrington

With an Introduction by Ryland W. Phillips

"Mr. Farrington has placed in our hands a valuable book, every chapter of which is well worth our careful study. He has given us an analization of the business side of our daily work, he has attempted to show us not only 'how to make a studio pay,' but how to make OUR studio pay better. I say this because I believe there is not a photographic establishment in existence that has yet reaped its possibilities of profit taking."

—From Introduction by Mr. Phillips.

CONTENTS

The Man and the Location	How to Know the Profits
Buying and Arranging the Stock	Credit and Collections
System in the Studio	Developing the Side Lines
The Treatment of Customers	Advertising You Can Do
Business-Getting Schemes	

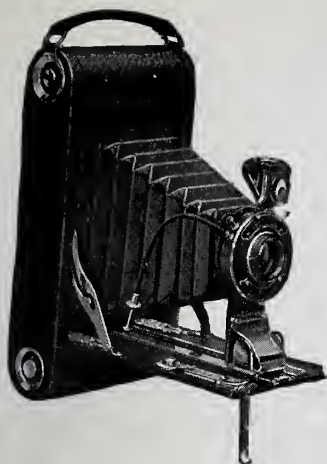
Cloth Bound, 12mo., Price, \$1.50, Net, Postpaid
With subscription to PHOTOGRAPHIC JOURNAL OF AMERICA, \$3.00

EDWARD L. WILSON CO., Inc.

PUBLISHERS

122 EAST 25th STREET

NEW YORK



3A Scout Roll Film Camera
Pictures $3\frac{1}{4} \times 5\frac{1}{2}$

Down to Pre-War Prices!

3A Scout Camera

\$14.95 regular price \$21.87

A fortunate purchase of several hundred of these guaranteed, high-grade, perfect 3A Scout Roll Film Cameras enables us to dispose of them quickly at the remarkably low price of \$14.95.

The 3A Scout has a remarkable double Rapid Rectilinear Lens—a five-speed Shutter—reversible brilliant Finder and uses all standard make roll films. Complete with Photographic Manual of instruction. Price includes war tax.

Only \$14.95 Which Saves
You \$6.92

WILLOUGHBY'S - - 110 West 32d Street, New York

Established 1857

CHAS. COOPER & Co.

MANUFACTURING CHEMISTS

194 Worth Street, N. Y. City.

Works, NEWARK, N. J.

WE OFFER TO THE TRADE:

Acid Acetic
Acid Pyrogalllic
Alum Chrome
Alum Powdered
Collodion Photo
Cooptol (in place of Metol)
Cotton Absorbent

Gold Chloride
Hydrochinone
Mercury Bichloride
Potassium Ferricyanide
Silver Nitrate
Sodium Carbonate
Sodium Hyposulphite
Sodium Sulphite, etc.



Send for Circular on How to Save Waste

NOTICE

To Our Readers

OWING to unsettled conditions and other difficulties, it is impossible to determine with any degree of accuracy when magazines will reach their destination, and your copy of the *Journal* may be a few days late in reaching you. Our mailing schedule has been adjusted and arranged, as best we can, to meet the unusual conditions now existing. We are making every effort to maintain prompt delivery, but if your copy of the *Journal* is not received by you, or on sale in the accustomed places at the usual time, you will at least know the reason why.

The *Journal* is published the first day of each month. If it does not reach you about that date please be patient. Nine cases out of ten your copy will eventually arrive. If it does not, notify us.

EDWARD L. WILSON CO., Inc. Publishers the Photographic
Journal of America

THE PHOTO-MINIATURE SERIES OF MONOGRAPHS ON PHOTOGRAPHY

No. 177: SELLING PHOTOGRAPHS TO ADVERTISERS

Telling how to get the business in this profitable field.

Price, 40 cents

No. 176: The Significance of Design in PICTURE MAKING in PHOTOGRAPHY

Written and illustrated by JOHN WALLACE GILLIES.

Price, 40 cents

No. 175: STEREOSCOPIC PHOTOGRAPHY

The only handbook to this fascinating field.

Price, 40 cents

No. 174: HOME AND GARDEN PORTRAITURE

Practical, working methods. Illustrated.

Price, 40 cents

No. 173: FIGURES, FACTS AND FORMULAS

of photography, 1915-1919. 2d series.

Price, 40 cents

No. 172: THE HANDS IN PORTRAITURE

Written and illustrated by CHARLES H. DAVIS.

Price, 40 cents

No. 171: RETOUCHING & ETCHING NEGATIVES

A practical guide to all the methods.

Price, 40 cents

**Sold by all
dealers—or**

Post free from the publishers
TENNANT and WARD,
103 Park Avenue, New York



RYLAND W. PHILLIPS
BY THE HOFFMAN STUDIO
PHILADELPHIA, PA.



The PHOTOGRAPHIC · JOURNAL · · of AMERICA ·

VOLUME LVII

SEPTEMBER, 1920

NUMBER 9



COMPOSITION IN PORTRAITURE

By "PROFESSIONAL"

IN ARRANGING the composition in portraiture have the *general* run of lines conform to the shape of the picture—up and down in a vertical, from side to side in a horizontal, or in curves if the composition is destined for a circular or elliptical arrangement. This does not necessarily imply that these lines should be unduly prominent. Even the Hogarth line, which adds grace and beauty to any composition, must not be too assertive, although it may be stronger than a straight line. The latter, which gives dignity and strength, as well as stability, should not, on account of its great attraction, be used more than necessary.

A position very much employed by photographers in "bust" portraits is one where the body is turned considerably to the side. The further shoulder and side of the body is, to a great extent, not seen in the picture, while the near shoulder is exactly or nearly facing the camera. If the sitter is portly, and sometimes even if not so, provided much

of the back shows, this pose will give the figure the appearance of stooping. The pose is then either moderated, the figure more reclining, or the print is cut quite close on the faulty side. However the figure is posed, an *oblique and prominent broad line* will run from the head and in front of the picture to the lower corner on the opposite side from that in which the head is located.

When this is the case the picture will lack balance, even though the prominence of the line is kept down by a judicious use of the ground and lighting, unless the *axis* of the composition is *opposed* by the line or lines of sufficient force to counteract it. This may be done in a variety of ways. It is most effective when these lines are opposed to the strongest or most attractive part of the oblique line, as it brings the correcting line nearer to the part that needs balance, rather than at the diagonal and toward the extreme ends of the picture, although, of course, it can be and is, however, frequently so balanced.

When the pose is that of a lady, the arm nearer the camera is frequently used for the accomplishment of this purpose. The forearm from the elbow to the hand can easily be posed in a variety of ways to form an opposing line of good weight in attraction, and being located near the centre of the line, it would extend across the same where most needed. Care, however, should be taken that the arm is not so posed as to be too prominent, or by receiving an undue amount of light to suggest inaccuracy in drawing or foreshortening. We always have the arm to fall back upon, but the advisability of its *sole* use in balancing the oblique line would be frequently questioned, as, for instance, if only the bust pose is desired, and not more of the body. In this case the hand and arm might be better introduced.

If the subject still is that of a lady, and it is not desired to show so much of the seated figure, then, perhaps, the hat, if suitable, could be introduced as an aid. The head bent slightly in the opposing direction will, with the hat, do much toward restoring the balance. The balance can further be improved by introducing a fairly strong light, *a la silhouette*, at and following the line of the shoulder against the ground at the back of the head. With this slight bend of the head, assisted by this little light, and some slight arrangement of the drapery at the front of the dress, we apprehend sufficient balance could be effected to suffice.

In the case of a man, the line of the upper pocket in the coat, assisted by proper arrangement of a handkerchief, slightly shown, and the line of the coat collar at back of the head, together with a little of the shoulder, which make a forceful line, can all be made helpful.

Counter lines or suggestions of elongated small masses of spots may be introduced by working on the background of the negative (on the glass side) near the strongest point of this oblique line.

A square picture which will photograph not too strongly may be introduced in the picture ground.

The oblique line is important, and if too strong must be balanced. This may

be accomplished by accenting other lines.

In strengthening the line back of the head and a little down on the shoulder to restore balance it should not be made so prominent as to interfere with ready "concentration of interest" on the face. It will, if properly done, assist in this concentration.

Look up one of your old photographs posed in this way, where the balance is not quite what it should be, and experiment upon it with your moist tubes of water color, white and black, mixed in proper proportions, or pure, as the case may be. Note the various effects obtainable by working over these and other parts of the picture. When you make the pose again, you will more readily and speedily work a solution of the problem at the time of arrangement without resorting to subsequent treatment of the negative.

Avoid parallel lines unless insignificant. If so prominent as to be offensive rearrange them. We do not personally object to their occasional use, although many of the writer's friends disagree with him in this respect, claiming that *all* lines that are at all similar should be changed.

Balance *all prominent* lines by counter lines, but not necessarily by right-angle ones—in fact, the occasions on which they will be required are rare. Be careful to avoid symmetry which is objectionable in art. Because you have one line here running one way, don't plan to have another contrary one to offset it, and so on, balancing each one by another; they become unduly assertive when treated in this way. They are likely to make your composition to some extent resemble a checker-board. *One good line balances a lot of smaller ones of less weight.* Remember, vertical lines add dignity and strength; horizontal, repose; diagonal and opposing, action. So don't kill the power and force of your lines by overdoing things. Study it out, and do not, except in cases of necessity, employ opposing lines that may tend to kill the character of the arrangement.

"Line is not the chief thing in drawing. It is color. In nature there is not such

a thing as line. Objects may appear in strong relief, or softened so as hardly to be seen. They may have a round, square, or flat edge, but the supposed line is nothing but a distinction between colors.

"A white hand even may appear to have a sharp outline, but this is because of the contrast of the coloring of the flesh, and the clothing, etc.

"In painting, line and its correct drawing may be said to have a real existence, but that it is primary and all other features secondary, is an extravagant expression from partisans of this view.

"Color may be said to be the symbol of life, for so associated is it, in our minds, with animation, virility, growth, power that its absence means the presence of death.

"True form may exist in a way independent of color, as in charcoal work, etching and engraving and so the blue of smoke and clouds, the green of the ocean, the sheen of a silk or a rug, may be expressed with little or no line, but in the main one is dependent upon the other, and both are necessary features of painting.

"In music harmony is for the present, at least, the final word—nothing beyond it—and so color harmony is now the loftiest pitch to which the painter may attain."

The above quotation, from John Charles Van Dyke, which refers to the painter, is also to a great degree applicable to us, as producers of pictures in monochrome—for color—with its values, and "texture" (which will be mentioned later on) play a part equally important in our work. It is a great mistake to think, because we work in monochrome, color values, tones, etc., are not quite possible with us.

To quote Van Dyke again—from *How to Judge a Picture*:

"Beware of bright pictures, for they are generally bad. This caution is for the great majority of pictures. Of course there are exceptions."

"It is worth while to give more attention to the low-toned, deep-toned, and rich-toned pictures than to those pictures pitched in high keys."

Equally true is this in our work. Very rarely indeed in professional portraiture does it occur that photographs in high keys are a success. Our monochrome results make us even more dependent on color values than in the painter's art.

To judge solely from the work widely made throughout the country, and more especially from that sent to our various exhibitions, where it is to be expected that it embodies the best understanding and ability of the makers, the writer feels that there is great need of a better understanding in our profession of "color values" and "tone," and the possibility of their practical attainment. Although from year to year it is noted that a larger number of our exhibitors are progressing in the principle of art (which is immediately noted and commented favorably upon by those who have for years been noticing their work), yet there are many who always attend conventions, seriously inclined and very anxious to improve, who do not seem to grasp this elusive thing so very needful to their advancement. There are others who exhibit the same class of work year after year, keeping abreast of the times in technique, various novelties, etc., and yet "stand still," at least as far as progress in the art is concerned. They may show new positions, or possibly a growth in breadth or simplicity of treatment, but the faces of their portraits show the same old style of work that they have been making for years. Many of these men are so grounded in genuine and unmistakable knowledge of photography, by their many years of study and practice, that I am fain to believe it does not occur to them as possible that *all* of us, *the writer most certainly included*, could at times sit at the feet of some of the younger men in photography, and drink from their knowledge to our own decided advantage and advancement.

There are, however, a few men whose work and ability in the old school of photography is such that we must not class them with the larger body of unprogressive photographers. There is a difference and a vast one. This latter class is fully cognizant of what is known as the "new school," its aim, and how its

work is produced. They show it not only by their arrangements in composition, etc., but in many other ways. They do not *believe* in the new work as a whole, and have an honest opinion on the subject, but their regular work is founded on lines compatible with the newer methods, and, *to a very limited* extent, as far as they approve of the principles, they permit themselves to go. With these men it is not lack of information that is at fault, but solely that of not being in harmony with the more modern class of work. To these men these remarks will probably fall upon stony ground, but to the seeker after advancement the writer very much hopes that there will be something here that will clear the atmosphere to the extent, at least, that it will set him in the right direction. We all, at times, need to be steered correctly, and even then are prone to go astray.

Color values, in brief, mean the production in pictures of the various values of all the colors observable in life or the original. In a strict sense this is only possible of attainment by the artists of the brush.

In monochrome pictures of one tone, it means the reproduction in this one tone of the values of various colors separately, and in their relation to each other. This is possible, however, only to the extent that their luminosity impresses us with the handicap incident to the incorrect rendering of their luminous values, due to the limitations of our plates. The special plates made for this purpose do much to lessen this error, and, if worked for all that is in them, values in our one tint would on the whole, we think, be as nearly correct as most color combinations seen even in some of the highest class of paintings. These are often faulty in this particular, although great in other ways.

Now, a few words as to the various kinds of plates prepared for the purpose of more correctly reproducing the luminosity of these colors, holding back those which photograph too quickly, and permitting quality to be obtained elsewhere. They permit the reproduction of light golden hair more nearly as it should be. They save very light and

at times colorless eyes from being practically lost. These plates are variously known as the panchromatic, orthochromatic, etc.

Some of them are especially prepared for landscape work, and others for portrait work in the studio. All are fitted to meet the special conditions in either field.

It is not the purpose of this paper to go into the subject of wherein these plates differ, as this can be worked out by the reader, in conjunction with the various demonstrators of the manufacturers' products.

Let that reader who may not have given much thought to the color values, as represented by the flesh tints of his subjects, as well as the drapery, backgrounds, etc., used in arrangement of his compositions, place his assistant in position for a picture under the ordinary portrait light. Let him view the subject from a little to one side, so that the narrow shadow side will be of proper strength, clearness, and depth. Suspend from a head-rest, a pure white card-board on the light side of the face, on a line parallel with the ears of the sitter, so that it will receive exactly the same light at the same time without throwing any shadow or reflecting any light. A few inches away from the head is sufficient.

At a few feet distant, note the effect of the color on the face, contrasted with that of the card-board. It will be noted that the general color of the face is yellow, gray, florid, etc., to a greater or less extent, and that it is in some instances blended with a tint of pink, red, or shades of brown; while various parts of the face—lips, nostrils, cheeks, under the eyes, by the mouth, nose, and on the forehead—will tend either to other colors or verge into various deeper tones of the general local color of the complexion.

This general color scheme of our subjects of course varies greatly with different people, not even excepting children.

The contrast between the face and the white card-board is very marked, and the most skeptical reader must admit that the making of pictures of our sub-

jects in which the faces and hands are represented by *white paper or values akin to it is all wrong*. It should not be countenanced in our work.

The pictorialist will, in his working light, expose, develop, and print his negative so that the color values of his model and the depth or richness of the composition will show in his print—*i. e., in some degree of relatively dark tones, of black or sepia as the case may be*.

As this class of our co-workers are more or less *insistent* upon carrying out their views, they naturally appeal for patronage to that class possessed of sympathy with their methods. Among this class of artists of the lens there are some who carry their views of color, tone, breadth, atmosphere, etc., to such an extent that their productions have caused a revulsion on the part of some of our better professionals, who are otherwise very indulgently inclined toward pictorial work, and who, while they are themselves working to some extent along similar lines, are now doing so with their hands outstretched to check a too rapid stride, for fear they may be dashed to pieces in the end.

The writer is not unwilling, as the reader will perceive, that someone else shall set the pace for radical departures from conventional customs. He believes, however, that some such departure will be healthful, inasmuch as a clear understanding of that which is best to be retained or rejected along these lines cannot but eventually prove a benefit to our art.

History is full of examples of the work of the extremists in all fields. That this work sifts itself out, and in the course of time reaches more nearly a middle ground, is well known.

The ultra school in our art will have made its bid for favor, and will have done its share toward our advancement. It will have presented its claims for recognition. In due time judgment will have been rendered, and wisely so at that.

Now, as to obtaining color values in face, neck, hands, hair, drapery, etc. We will put it to a common-sense test. We will take it for granted that many of our readers who have not done so in

the past, will, if they are really desirous of improvement, adopt it in the future. With this understanding, we will proceed.

The general or local color of the subject may be gray, slightly yellow, or it may appear that the tendency is toward a delicate tint of pink, etc. Don't then strive to produce a deep tone in the final print—in other words, have the negative such that it will give a strength of color commensurate with your impression of the original. Place the sitter under the light, therefore, with due regard to location in view of the result desired.

If in too strong a light, different planes of the face catch an undue quantity of light, and are accented in consequence, the lights on these places will be out of value with the rest. This result will follow whether the subject is of fair, medium, or dark complexion. All subjects *must be far enough away* from light to prevent these accents being reproduced *in undue proportion*, if values are to be preserved. Only that quality of light necessary to modeling should be used. The distance of the sitter from the light—beyond that necessary to prevent undue accents and the strength of the softened light that falls upon the model, denotes what, with proper exposure and development, will be the ultimate tone or depth of dark in the finished print. It gives you the low or very low-toned effect; thus, other conditions being equal, influencing the character of your negative.

If, when the subject is placed in position, the protuberances of the face are unduly accented, pull the chair or platform away, a little at a time, till these places receive their proper amount of light. If the room is large enough the size of the light makes no difference. If the room is narrow, cut down the size of the light till you get it right to suit the width of the room. Don't try to obtain the result by working close to a small light, which if strong is brilliant, and if small lacks in general illumination. The result in consequence is black shadows, glass for backgrounds, accented lights, etc. This is *not* what is wanted, but a mistake that has been made for years by many workers.

An open skylight as large as possible, a subject away from the light, *no* reflectors except the properly toned wall of the room, or at most a medium-painted gray ground some considerable distance away, constitute the conditions under which this work is produced. This ground will preserve the shadow of the face, rendering the shadow eye as perfect in reproduction as the other.

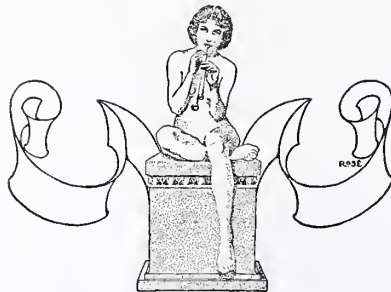
Pictures on these lines may be made in *all lights*, by simply selecting the proper location for the sitter. Some of the most beautiful effects are possible with the subjects directly facing the light, where detail is shown under the eyebrows, as on the cheeks. The subject may be posed in corners of the room, or even two or three feet from the skylight side of the room, *if well back of the light*. All that is required is an appreciation of what is needed in the resultant negative. The above remarks are not necessary for the guidance of the expert operator, whose ability is such that he can produce pictures where many would not think it possible. Recognition of the following points will serve as a guide for those who may lack experience in producing pictures that possess color values and tone. These are:

1st. Keep your subjects away from

and not under the open skylight. Allow no direct light to fall from overhead, accenting too strongly the prominent parts of the face.

2d. If the subject is placed directly facing the light, don't let the strongest point of this light come from a point below the head. An angle of from 35° to 50° is better. If too low the value of the eyes will suffer. Give full exposure to your negative, use large stops, and develop so that when dry the negatives will yield prints where the high lights are all tinted, the degree of tint there imparted determining the high, medium, or low-tone character of the negative.

Have the light that comes into the skylight room *pure as possible in actinism*. Keep the skylight glass and white curtains, if used, clean, so that the light that enters is pure. Its diffusing qualities will round up the shadows and assist in producing the values of the drapery. If the skylight and curtains are dirty, the purity of the light is impaired to an enormous extent and the whites only are photographed with blank results. Their values are lost, and the drapery especially, if dark, is entirely wrong. Try clean skylights and curtains for six months as an experiment and see the improvement.





BY JANE REECE
DAYTON, OHIO



SOFT-FOCUS LENSES—THEIR USE AND ABUSE

By FLAMBEAU

SOFT-FOCUS lenses are becoming constantly more popular, especially in America. This is because they show superior pictorial results compared with those produced by an anastigmat. They have been too long in securing recognition by the many; and some photographers still fail to see any advantage to be derived from their use. This is owing to misunderstanding concerning them. Through misconception of the requirements of modern art, and the true functions of these objectives, they have been greatly abused, as well as misused, even in the hands of some of their advocates.

To use the soft-focus lens effectively one must know thoroughly their distinctive attributes; also what one desires, or should desire, to do with them.

Attributes

Many—perhaps most—photographers believe that the only special quality possessed by these lenses is that of diffusion. This has been published from time to time as a fact. Now, diffusion is perhaps the least desirable of its several distinguishing merits—that being only one means to an end. The advantages of these instruments for artistic effects are:

First, in enabling a worker to operate synthetically—to render his subject in masses instead of details; just as other lenses will permit him to depict his themes analytically—with facts distinctly and profusely expressed and objects identified. By employing a soft-focus lens, the photographer can now interpret nature in monochrome with breadth of effect just as well as a painter can do it, and more easily.

Second, with such lenses true differentiation of planes can be had consistently, which is not the case with a fully corrected lens.

Third, these soft-focus objectives render light better than any other type of lens can do it. I am aware that, in some

hands, light has been depicted by these instruments such as was never seen on sea or land; for example, as snow-balls of halo shown among the foliage of trees and elsewhere. But that was because the photographer did not know how to use the lens, or else the one employed was improperly constructed. Lenses of the type are now made that exhibit no halo, flare, etc., at an opening of $f/5$. With such a lens, in competent hands, light in its varied aspects—even fleeting effects—can be secured and presented truthfully and in a manner greatly superior to a fully corrected lens.

Fourth, as moods can only be interpreted by means of light correctly rendered, the soft-focus lens, surpassing all others in depicting light, is paramount for representing moods.

Fifth, such art qualities as suggestion, mystery, breadth, etc., can only be successfully produced by a soft-focus lens; for an anastigmat, for example, cannot suggest, it must identify; and it is too matter-of-fact for mystery, etc.

Sixth, delicacy and tone, qualities of utmost importance oftentimes, are secured, as far as the lens is involved, better with the soft-focus than with any other, in my opinion.

Seventh, I think it was Constable who said, "Rocks, trees, mountains, plains and waters are the features of landscape; but its expression comes from above; and it is scarcely metaphorical to say, Nature smiles or weeps, and is tranquil, sad, or disturbed with rage, as the atmosphere affects her." Now, it is almost impossible to secure true atmosphere consistently with a fully corrected lens; but a soft focus instrument renders it easily and truthfully. The "lost edge" of the latter contributes greatly to this. Therefore, I have found that lens superior for atmospheric expression.

All this is far from showing diffusion to be the sole benefit to be derived from employing a semi-corrected lens.

How to Use

In using a soft-focus lens one has to know what one wants. If art principles are unknown, or but little known, to employ it will result in failure in pictorial work. Only if one knows, and to the extent one knows, can success be achieved. Of all the disgusting works of alleged art that are produced, hung or published, those made with soft-focus lenses rank the rankest, if not the result of knowledge and skill. The cause is to be found in the ignorance of the photographer, not in the lens; although a particular instrument and its manufacture may be to blame in certain cases.

What is required by the dictates of modern art? This demands an impression or illusion of Nature. "Art has nothing to do with things as they are, but only with things as they *appear* to be; with the *visual*, not the *actual*; with *impressions* not with *realities*."¹ The man who renders facts as facts is a scientist, not an artist; for science gives us "the truth, the whole truth and nothing but the truth." Art sets forth what the artist sees, from where he sees it, although he may know it is really different. He will represent the successive planes as he sees them and the objects in each plane just as they appear to him and in no other way. It is a matter of distance and standpoint.

All this is what a pictorial photographer should do, and can do, with a soft-focus lens. He cannot do it with any other, or not so well; but with a semi-corrected lens, when one knows how, it can be done in a manner true to the visual in Nature, art and experience.

Because this is not adhered to, most users of soft-focus lenses fail, especially in portraiture. For the subject of a portrait is always nearby and, consequently, seen clearly, and modern art requires things observed distinctly to be so rendered. Instead of this, most portraits made with semi-achromatic lenses are either vague, flat or are smudges, with little modelling or none; one eye knocked out, or both; half the face as black as ink, the other shapeless and

chalky from halo. Many persons are depicted as they should be if they were in the middle-distance or distance. Some pictorialists of reputation perpetrate such things. And they seem to be proud of it, for they flash their names from them. In the future these "works of art" will not be regarded as great ornaments when hanging from family trees!

To Focus

One should focus with a semi-achromatic lens to get just what one wants. With an anastigmat one would focus to obtain every thing as sharp and detailed as possible; for the chief function of that instrument is sharpness. With the other, one should focus for the opposite—for effect; to mass; for breadth; to suggest;—foreground clear, the principal object or plane softly emphasized; middle-distance only slightly defined, and the distance indistinct and lightened, etc. This will simplify the scene and make objects and things so unobtrusive that the character, spirit, sentiment or mood will arrest and impress, the motive that attracted the artist will be passed on and felt by the beholder of the picture, and realities will not divert from the deeper meaning. In focussing a portrait get the features clear and full of expression, even when it may be desirable to simplify the clothing. Thus, one focusses, not for one thing only, but for many—for all one sees or experiences. In some cases, if one focusses the distance so that it seems right, the rest of the view will automatically assume its natural and desired aspect. But bear in mind that one cannot get sharpness with a soft-focus lens; that it is useless to try; and the lens should not be condemned because one cannot. If one could it would not be a soft-focus lens.

Enlarging

What has preceded supposes that a soft-focus lens is to be used to work with direct. Some take their pictures with a fully-corrected lens and enlarge with a semi-achromatic objective. This procedure will show a great improvement, as far as softness is concerned; but it will not give all one might secure, in the

¹ Birge Harrison in *Landscape Painting*.

case of landscapes, by the other way about. When a negative is made one must take and be satisfied with what it contains, unless one wants to resort to "faking." It cannot be altered much without getting something entirely different, be it better or worse. I have seen it published several times that, to get the full benefit of soft-focus quality by enlarging as indicated above, one should make a positive and from that a new negative with a soft-focus lens, then make the enlargement. What is the use of going to a lot of unnecessary trouble, of wasting plates and time, of often making mistakes to be rectified and, finally, fail to secure much that is desirable, when, if one has a soft-focus lens to enlarge with, or make a negative from a positive, one can take it out and get the negative with it direct and proceed in the usual way? If the subject is taken with a soft-focus lens it can be enlarged with a fully-corrected lens, if desired, and nothing important be lost or changed. But it seems to me if one is going to use a soft-focus lens that one should do it throughout, or drop it—no partnership is needed or desirable. There is no necessity of one bringing in the anastigmat in the first stages at all.

The above refers to landscapes, for various reasons, some of which appear in the preceding paragraphs. A portrait, I think, in most instances, is better made with an anastigmat and enlarged or printed by projection through a soft-focus lens; as in such cases no planes sentiment, moods, etc., in the same sense as in a landscape, are affected and only softening of outlines, massing, etc., are needed to be introduced. Some skilful workers, like Garo, succeed direct; but there are few Garos, and the way I have suggested will best serve the vast majority, judging from their results.

Control

Many believe that those who work in oil, bromoil, gum, etc., would best employ an anastigmat and resort to after-treatment in those media. The soft-focus lens is for those who desire to do straight or direct artistic photography, with but little or no control or

after-manipulation. It is likely there never would have been any control processes if photographers had had earlier an objective with which they could have obtained artistic effects. As soon as pictorialists learned what was needed for artistic expression, they found it could not be secured direct with the instruments they had, so they were obliged to resort to control and manipulation to supply the deficiency. Much beautiful work has resulted. The soft-focus lens now meets the requirements, and many do not see the need longer of control. Where the worker in pigments softens his outlines and broadens his effects with brushes, etc., the other does the same thing with his soft-focus lens; where the former obtains suggestion, mystery, etc., by hand-work or manipulation, the latter gets it by focussing; where one puts in clouds or gradates the skies by brushwork, the other uses a graduated filter and obtains clouds or graduation in his negative along with the landscape. The latter stands the better chance, in my opinion, of getting and passing on the impression that attracted, and of being more true to Nature; the former may have to (and often does) offer a result he never saw and can never duplicate. I am not advocating either method in preference to the other, only trying to show what can be done with a soft-focus lens. There are many workers, however, who employ a soft-focus lens to get their pictures and use control methods to complete them.

Advice

Discard the idea that all it is necessary to do in order to become a photographic artist is to get a soft-focus lens and take pictures as blurry and indistinct as possible. "Mush" is not impressionism; mystery is not obscurity and disintegration; suggestion suggests something; invariable vagueness (except in nocturnes, etc.) awakens the suspicion that the one who perpetrates it is either possessed of defective vision or is—queer! When a scene, object, or effect is clear, do not mar it by indistinctness; when these appear indefinite, do not alter by rendering them plainly. Give

your own impressions or the emotions you experience, the best you know how. The result may not be appreciated by some, but others will value it; and you will have one satisfaction, at least—to know that you express your own idea and not that of someone else.

Again, be very careful what soft-focus lens you buy. There are those designed to be of this type and advertised which are not, in the true sense. Others that are manufactured may be good or not, and you are just as likely to get a poor one as any other. There does not seem to be any uniformity in the production of some of them. Therefore, every intending purchaser should make careful investigation, and not conclude hastily that one is as good as another, as is usually the case with anastigmats. I know of but one or two firms whose objectives of the type referred to are in any degree invariably excellent.

Finally, do not believe all the claims made in advertisements. Opticians have to make soft-focus lenses to meet the demands, and as this is mostly for fast-working instruments they must offer

such or be regarded as behind the times. Recently a professional photographer showed me one of these lenses he had had made specially, sixteen inches focal length, working at $f/3$! I saw what he got with it—just what might have been expected. Now, an optician knows that, in the case of a soft-focus lens, he cannot make one that works better than $f/8$ in the longer focal lengths, or at $f/6$ in the shorter, without sacrificing one quality to gain another. If you crave, and obtain, larger apertures you are courting trouble and will get it, in many cases. With modern rapid plates, $f/8$ is fast enough for most purposes and will give excellent results. It is faster than $f/8$ used to be with the old lenses and they answered very well, and many are still using them. If you get a soft-focus lens that really does good work at greater openings, so much the better. If not, and you want more speed, instead of getting it by larger stops, I would advise you to put more light into your studio or, if it is required outdoors, give *time* exposures instead of snaps. With a soft-focus lens it is *quality* that counts, not speed.

DREAM, MAN, DREAM!

“**W**HERE there is no vision, the people perish!” The seeker after homely truths in the Bible does not lay it down unsatisfied. We have one in the quotation. And it is a truth.

The man who starts out in business without a vision of what that business is to be, doesn't get very far. He has no imagination, nothing to look forward to. He opens his door in the morning, waits on those people who come to him for what they need and closes the door at night, no nearer the goal toward which he should be working than he was the week before.

Some of the old practical fellows will tell us that imagination has no place in business. They tell us that imagination runs away with business men. But look about you at successful men. Where would they be without having carried

with them throughout their business lives successive visions of their businesses of the future?

Worship at the shrine of vision and work out those details that will make of your visions realities. Determine what your business should be, what it can be in your own community, and then work, work, work.

Learn all you can of your competitors. They have some weak spots. And those weak spots will make way for your entering wedge.

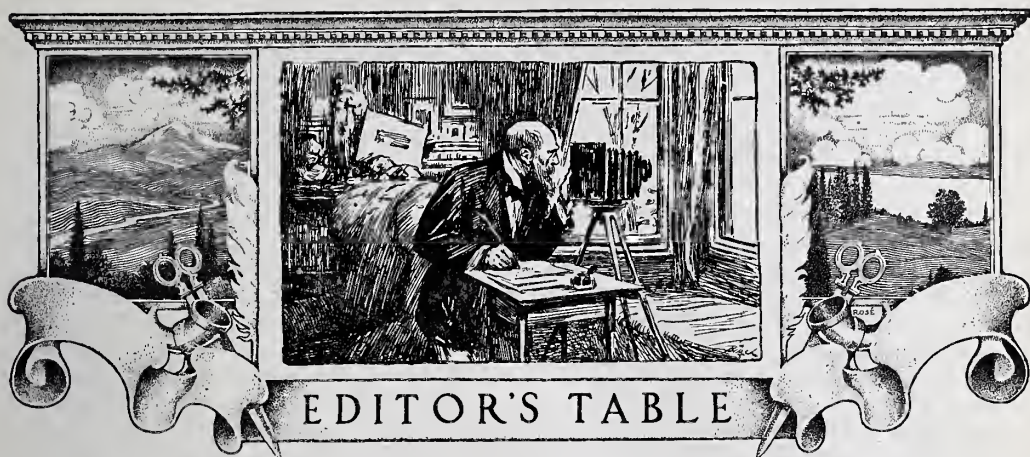
Vision alone is helpless, worthless. Work alone will bring to pass those things which vision tells us are just beyond, just over the top of the hill. Climbing the business hill is no snap, but climbing would have nothing before it if one had no vision of what the climb was for, of what the top of the hill would disclose.—*The Couchmaker*.

EXPRESSION AND LIKENESS

ON what does likeness depend? It seems a simple question, but it is one which cannot be answered easily off-hand. Likeness is associated with detail of feature; but this is not a sufficient definition, for we can recognize our friends a block away when not a single feature can be defined. Perhaps likeness lies in the masses of light and shade; but these vary according to the light, or the hat worn, or a score of other variable quantities. It can scarcely be considered as lying in outline, for little of unvarying or distinctive outline is seen except in profile and we do not see much of our friends by profile. At least it may be considered that likeness at close range depends more on the surfaces than on the outlines of the face. Doubtless the eye is familiar with every detail of feature, every mark, and is equally conversant with every characteristic pose or gesture, and with every appearance of masses of light and shade on the face when at a distance. The eye sees a figure at a distance, and at once recognizes it, without knowing why. It may be a peculiarity of walk or poise of the head. That is all that can be seen at a distance, but for the rest, it is known to the mind of the one who sees, and that is sufficient. A figure is known to a certain extent by its motions; for many persons, especially men, have some peculiarity of gait. But to endeavor to reproduce this peculiarity would in photography lead to disaster; caricature is best able to portray it, and that is a province that professional photography has no wish to enter, though it may occasionally unwittingly stray in that direction. "Arrested motion," as it is termed, is the rock on which such attempts come to grief. But if the suggestions of motion in a figure be beyond the scope of professional photography there is yet left to us the equally characteristic attitude of repose; every man—every woman

—has a characteristic attitude, and in that attitude there is one chief and dominating factor. It may be some beautiful pose of the hands or the placing of the arms. It may be a frown, or a craning forward of the neck, or any one of a score of things. In any full length the appreciation of a characteristic attitude goes far toward success.

The photographer very naturally, and inevitably, makes the portrayal of the face his chief business; but probably a mistake has been made in too much of exclusiveness in this direction. The obtaining of a more comprehensive likeness, as opposed to mere detail of feature, is a class of work with possibilities; and is a class apart from the mere pictorial rendition of three-quarter or full lengths. This latter is very beautiful, and has both a commercial and an esthetic value; nor can it be said that we see too much of it. But there is equal room for rendering in which the merely pictorial yields in part to character. This character-likeness is indeed to the figure what expression is to the features, and it is to be obtained in the same way. Without expression, the features, however beautiful or however correctly photographed, are a mask rather than a soul. With it we obtain the life and charm of the true portrait. Expression can seldom be conjured up by the sitter; it must come naturally and spontaneously and without consciousness. There is an art of taking beautiful photographs, which from their beauty are pleasing to all who do not know the originals, and which are considered as likenesses because they are recognizable. There is also an art of obtaining a true likeness—and one not incompatible with beauty or pictorial quality—through a correct rendering of attitude and expression. And this latter is not cultivated as much as, with profit, it might be.



"BETTER BUSINESS"

ONE of the most interesting and promising signs of the times, from the viewpoint of a professional photographer, is only beginning to make itself apparent. The sign of promise is to be read in all parts of the country in the increased attention that is being given to the development of what may be termed the purely business end of the photographic problem.

The National and State associations are devoting space in their programs and time in conventions to its exploitation and discussion. The several photographic journals throughout the country have devoted considerable space to this subject, and it is more and more claiming and holding the individual attention of the progressive professional.

It is now coming to be very generally conceded that most of us are long on the artistic and short on the business side of photography. As the situation is becoming clear, and photographers are realizing, as they never have done before, that they must adopt modern methods of business in their studio and conduct their work on the same lines that alone make other business profitable, the outlook of the professional photographer improves.

The past few years of the war-period, with the culminating aftermath, have brought us face to face with economic conditions which must be confronted and solved. While it is a time for hard,

plain thinking and practical management, the photographer who has his house in order need not fear. It is wise to be conservative, but this does not mean contraction. On the contrary, in order to meet these many problems, he must *expand*, and there is every reason and prospect that business in and out of the studio this fall and winter will yield profitable results to the photographer who has his business on a sound basis.

In waking up and reaching out after more business he consciously expands in every direction. The adoption of a more progressive policy in one part of his establishment leads to improvements in the other lines, until almost before he knows it he is producing work of a better technical, more artistic, and more salable quality.

The discussion and adoption of modern business methods in the photographic studio is one of the most promising signs of the future in the photographic craft.

ON HAVING A METHOD

OF the many causes to which failure in business is ascribed, want of method is the last thing that would be admitted, though more often than not the real reason of ill-success. We hear often enough of such explanations from bankrupts themselves as "want of money," "want of opportunity," "bad luck," "bad debts," etc., but if the

official receiver could be induced to state the causes of the majority of failures which come under his notice he would say "want of prudence," "want of tact," "want of knowledge," "want of purpose," and above all things, "want of method."

Yes write it up large: WANT OF METHOD; the true cause of half the failures in life. It has broken up homes, destroyed life's prospects, blighted ambitions, wrecked businesses, and broken men down in the heyday of life with worry, anxiety, and sorrow. It has sent men to work-houses, lunatic asylums, and prisons—aye, and filled many a grave. Yet men will go on trying to do business without method, heedless of the lessons they should learn by the sad experience of others, and blind to the teaching of their own bitter experience when trying to run a business in which method is either inadequate or totally absent. Day by day they are worried by troubles arising from their own errors, or the mistakes of their employees, or harassed by inability to get business done to time, or to make ends meet, and yet they cannot or will not see that the remedy is in their own hands. They blame employees when they should blame themselves. If employees are left to do as they please, it is foolish to blame them if they go wrong.

Let every business man ask himself, when a mistake occurs, whether he could not have done something himself to have prevented it, either by giving his employees proper instructions, or by devising a system of checking one man's work against another's which would prevent the possibility of such an error.

It has been well said that the employer should be captain of his ship, and his presence be equally necessary to its safety. Even in very large concerns which may be correctly described as a series of small concerns worked under one management, the employer should generally superintend, and by his books be generally cognizant of the principal details of his establishment.

We too often hear the heads of businesses say: "How can I find time to see after every little detail? I cannot

be on the spot always. I have to trust my employees, and the will go wrong sometimes." True, but how often may an error be averted by constant anticipation, watchfulness and organization. To our mind, an employer who excuses himself to a customer by laying the blame on his employees, accuses himself of weakness, if not incompetence. Never let your customer know or feel that you mistrust your men, or that you have no confidence in some particular department. It implies at once a weak organization. Take the blame on the shoulders of the business as a whole, set the matter right with the customer without entering into long explanations as to what this or that man or department ought to have done, and when you have finished with your customer, review the causes which led to the mistake, delay, or trouble, whatever it may have been; but before anything else, sit down in your own private office and review yourself and reckon your own responsibility. Don't haul the offending employee onto the carpet and lose your temper in abusing him. Just quietly talk the matter over with yourself. Try to kick yourself, mentally, for having a business in which a mistake was possible. Wasn't there something you might have done to avoid it? Isn't there a want of method about your business? Isn't your correspondence loosely conducted, and are not your letters badly filed, your books badly kept, your orders loosely given, your shop untidy, and your men allowed to become slovenly and unpunctual in their habits? Depend upon it, there's a screw loose somewhere.

Men are very much what their masters make them; their habits, as a rule, reflect the style of business as a whole. In well-managed businesses will invariably be seen bright, intelligent, tidy-looking men, whose every action shows their briskness and smartness. Every man has his place, and every man is in his place. There may not be an air of hurry-scurry and bustle; it is rather like looking at some intricate piece of machinery, some parts of which go slowly, some more quickly, and some with great speed, but each moving in

its appointed way at its given rate, and the whole uniting to turn out something perfected and finished from the raw materials which were put in. There is a master hand and master brain to start, stop, or guide the machine, and if he does his part aright the mechanism does its appointed work.

"Method," says one writer, "digests the matter that industry collects; it is a habit of saving time to all, and without which no business of any size could be carried on. It apportions time to duties; never trusts to memory. Diaries and indexed books are cheap and invaluable. Arrangement keeps, by means of books, an exact registry of every transaction; it has a post for every man, knows what every man

does, a place for every tool, a pigeon-hole for every paper; it keeps all books posted up, by which you are cognizant of what you are doing and have to do, enabling you to send out your accounts to time and make your collections promptly."

If men who are in the position of employers or managers would only study Nature a little, they would see what splendid lessons she teaches us, how everything in the universe has a place "where, though all things differ, all agree." But there are so many men in positions of responsibility who go through life seeing without learning. That is the reason why great success in life only comes to the very few, and they are invariably men of methods.

DISCONTENT

FROM healthy discontent comes progress. If no one had been discontented with the log canoe we should never have had the *Olympic* or the *Imperator*.

But discontent which is not controlled and directed by good sense destroys the happiness of its victim without bringing him betterment. It prevents him from enjoying what he has without getting him anything better.

No king, aristocrat or billionaire was ever known to be satisfied with his lot. Every man or woman, however fortunate he or she may seem to others, looks upon some other man or woman as more fortunate.

These are platitudes, and yet there are, we think, more than the usual number of people at this time who would be better for remembering and pondering them. The discontent that is apparent in our mood today is in a large degree a foolish discontent, not justified by actual conditions and not corrected by common sense. The radicalism which prevails in some quarters is the result of ignorance and of harsh conditions. It

has a justification, even though it is not wise in its efforts at advancement. But there is also a great deal of radicalism that cannot be justified in any sensible consideration of the conditions of life. America has come through the ordeal of a world war with comparatively little sacrifice. There is work for everyone, and good pay for work done, even for work badly done. There is a great outcry against the high cost of living, but spending is more lavish and heedless than usual.

A good dose of the salts of common sense would dispose of the discontent in the United States. Hard times might also work a considerable cure.

The political, economic and social conditions of American life are sound. The agencies of human progress are powerful and in the hands of the people. There is no perfect government, there are no perfect conditions anywhere, and there never will be till men and women themselves are perfect. Most American discontent is the result of ignoring these truths and the good things we possess.—*Home Spun Yarns*.



PRACTICAL PAPERS ON STUDIO WORK AND METHODS

The Photographer's Assistant

THE masters plead inefficiency as excuse for low wages, and bewail the lack of good assistants. The assistant pleads lack of means and absence of encouragement as excuse for inefficiency. Which is right?

The position of assistant in the average photographic business has been in the past anything but an enviable one from any point of view. He is expected to handle successfully a large range of materials which are sensitive to many influences, often in circumstances and with apparatus that are in themselves handicaps to the production of good work. The knowledge and skill required to cope with the never ceasing stream of technical problems are perhaps greater than in any other craft, not only because of the existence of those problems, but also because the photographic business is not so sharply subdivided into its many branches, and an assistant may be called upon at any time to do work of a kind quite outside his ordinary job, and is expected to produce results equal to those of a man whose regular practice it is.

That roughly suggests what is expected of the assistant as regards his work. Usually he is required also to keep an appearance above that of a wage-earner, such as a mill-hand, letterpress printer, or bricklayer, and to cultivate the affability of speech and manner which is perhaps the principal asset of the successful doctor or lawyer. The dark-rooms in which many assistants spend nearly a third of their lives and most of the hours of daylight often are little better as regards health or comfort than the workrooms of many years ago described so vividly by Charles Kingsley in *Alton Locke*.

So that compared with other crafts, quite apart from the rate of wage, photography exacts more, and offers less. That the average rate of pay, and consequently the social position, of the photographer's assistant, is comparatively very low is a fact, obvious and admitted. What are the natural consequences of this?

I think that assistants may be divided broadly into two classes. The first class has caught the fascination which undoubtedly exists in pho-

tography for anyone with average intelligence and a little imagination. If to these qualities the assistant adds ambition he usually becomes the master-man eventually, but the business knowledge essential to success is not easily gained during the assistant period. The second class, by far the larger one, and probably still more increased by war recruits to the business, comprises those who are by nature slack, unintelligent, or unambitious, and those for whom the handicaps and discouragements incidental to the struggle for success in such an exacting calling have proved too great.

The worker who has struggled to efficiency in spite of the many difficulties in his path still finds that adequate reward is not easy to get. He may have worked for a low wage for the chance of getting special experience, but the last rate of pay earned is still too often taken as the measure of a man's value. Many employers, far too many, are imbued with the idea that if they only advertise and sack, advertise and sack, often enough they will eventually secure for the inefficient's wage either one of the skilled men willing to work for little money to increase his experience, or one of the disappointed ones for still less. The result is that the latter either recover a bit of their ambition or sink entirely to the level of the man who only does just enough, and that hardly well enough, to earn his salt. The ambitious man very quickly picks up what he wants to learn and moves on, so that this type of employer is seldom suited for long. Another type of employer has greatly increased of late years in the shape of the "company shops," who turn out large quantities of inferior work by semi-skilled workpeople on the "factory" principle. The wages offered by these firms to inefficients are often much higher than those paid by firms of standing to expert assistants.

I have tried to show that the conditions fostered by employers tend to discourage a man from becoming efficient, besides offering him little reward if he overcomes the difficulties, often needless and stupid, placed in the way of his improving his ability. That there is "plenty of room at the top" is not true of photography, for there are always vacancies for those willing

to accept a low wage; but a man who has made a study of his business and knows his real ability is often turned down in favor of one who will work for a little less money. It does not seem to occur to the average employer that the careful and conscientious worker can easily save the extra pay he asks, both in time and material as well as in quality of output. Yet we find the employers continually bewailing the difficulty of finding efficient assistants!

Make the life of a really good assistant worth living, by giving him tools and material that will be a pleasure to work with, in clean and healthy workrooms, and pay him a wage that will permit him to have a decent home that he can take a pride in, as well as to have a hobby or two and the time to enjoy them in, and there will very soon be an army of assistants making themselves efficient. A few employers have realized this, and find it pays them well to pay their staff well.

This new feeling of self-reliance and impatience with injustice, if it can show itself so strongly in the most autocratic institution we have, is not likely to be shed when the khaki is left behind.—D. CHARLES in *B. J.*

Technic

UNLIKE his amateur brother the average professional photographer pays very little attention to the more advanced technic of photography. He is for the most part content if he can produce pictures of quite ordinary quality and concerns himself little with the more modern developments of photography. On the other hand, the amateur who takes his photography seriously, and who figures successfully at the leading photographic exhibitions throughout the country, is constantly studying the technic of photography, with a view to improving his own work—a course amply repaid by its results. This type of amateur photographer has at his fingers' ends the advantages offered by the various kinds of plates. Printing mediums are fully understood, while he is thoroughly familiar with the more recent advances along the line of color photography. This is merely mentioned by way of pointing out that when work of a more difficult nature than usual is being undertaken the advanced amateur can generally do it successfully, which cannot always be said of the average photographer who takes pictures for a living. We advise all engaged on professional photography, no matter what branch, not to overlook the study of technic, which may be beyond present needs. Such knowledge is never amiss, and is sure to be reflected in the production of finer work. Even great artists in the past have suffered through a lack of technical knowledge, though their execution may itself have been faultless. At least two, whose work has come down to us from generations through lack of technical knowledge, used fugitive colors which have robbed their work of some of its finest qualities. The moral for photographers is obvious.—B. J.

The Choice of the Mount

THE modern portrait photographer is faced with a problem of which his predecessor of a score of years ago knew nothing. When practically all prints were made upon albumenized paper and were mounted with a margin about an eighth of an inch wide, it did not matter very much what the color or the surface was. Added to this the fact that there was little choice, the range being practically limited to cream, maroon, green, and black, little scope was left for the exercise of individual taste. Platinum prints were treated to a white mount with a wide margin under the impression that they then resembled engravings, but few other prints appeared on anything but the orthodox "gilt bevel" card.

With the arrival of the bromide print there was a great increase in the number of styles offered to photographers, and a catalogue of mounts became quite a bulky volume. These also are things of the past, and we have reverted to more simple mountings, which give the artistic worker an opportunity of giving his pictures an appropriate setting. It is, however, not yet fully understood to what extent the effect of the finished production may be made or marred by the color and depth of the mount. Many photographers adopt a uniform color for all their work, thereby losing a valuable opportunity of compensating for errors or variations in color and contrast.

As the choice of a mount is largely a matter of taste it is impossible to give any definite rules, but there are certain points which may be indicated which will, perhaps, be of service to those who have not given much thought to the subject. Thus, if a print be rather flat or lacking in contrast strong contrasts should be avoided in the surroundings, a delicate gray picture calling for a mounting paper of a correspondingly light tint, not, as is sometimes seen, one with a pronounced black tint upon a white or very pale gray paper. It is a safe rule to make the immediate margin round the print darker than the highest lights and lighter than the deepest shadows of the picture, but there is an exception even to this, for in the case of a chalky black and white print a black "tint" and a light cream or white mount will, by contrast, give a softer effect.

In the case of rusty black prints the color will be improved by selecting a brown mount which, again by contrast, makes the black colder in tone; a cold gray, on the other hand, emphasizes the rustiness. Sepia-toned prints vary in color, even in the best-regulated studios, and should be made the best of by judicious treatment. As a rule, those inclined to be "foxy" show better upon gray than upon brown papers. Rich browns look well upon cream or gray; browns near the color of the shadows should be avoided, as the latter are apt to merge into the mount to the detriment of the composition. It is in this respect that a narrow tint round the print will be found useful, as it serves, too, as a separation between two nearly similar colors. Some photographers, especially ladies, use a

ragged piece of imitation Japanese paper as a tint, but this is hardly commendable when a stout paper is used for the print.

The surface of the mounting paper should receive due consideration, and generally uneven surfaces and "linen grains" should be avoided when no tint is used, as the inequality of the surface often shows upon the print. If such papers have to be used it is better to interpose a smooth surfaced tint, to prevent this occurring.

Dry mounting is now so generally used that it is hardly worth considering the older method. If, however, any other adhesive has to be employed, there is nothing better for flexible mounts than fish glue applied round the edges of the print only. If a piece of zinc, or even card, a quarter of an inch smaller all round than the print, is laid upon it, the thick glue is readily run round with a stiff brush, and if the paper is fairly thick there will be no sign of cockling.

If the prints are enclosed in folders these should match the mounts as nearly as possible, with, perhaps, an exception in the case of white mounts, which may be enclosed in brown or gray covers, whichever may be best suited to the print. As a rule, embossed emblems on the front of a folder give a cheap effect, although the monogram of the photographer is not amiss here.—*B. J.*

Concealing the Effort in Photography

At a vaudeville show we all enjoy watching a graceful dancer, a dexterous juggler, a clever magician, a finished musician, or even an acrobat; but we derive pleasure from their acts only if they are original, artistic and perform with ease. We would soon tire of a violinist, for instance, if he struggled with his instrument, showed undue exertion with the difficult parts, or allowed us at any time to realize that the selection he was playing was an effort for him.

Art is no longer art when we see the effort. Art conceals art. The artist must not reveal the mechanics and construction of the work.

Now all of this applies to professional photography. Too often the photograph not only shows the discomfiture suffered by the subject, but also the critical public is made to feel the efforts of the photographer, and so the artistic value of the photograph is diminished. The photographer should conceal the atmosphere of the gallery, the fixedness of setting and the fact that his sitter is striking an attitude.

It is a comparatively simple matter to obtain the desired results with professional models. While models have not, perhaps, the highest mentality, at least through experience they have acquired a certain amount of plasticity of pose which greatly aids the photographer in covering up his effort. The lack of pliancy in the ordinary subject can only be overcome by allowing the subject time to grow accustomed to the surroundings, to feel natural and easy. Then if the photographer watches closely he can finally determine what is a characteristic pose and natural expression.

Many people—especially men—dislike having their photographs taken by professionals, due

to the fact that the results obtained are more stilted, artificial and less lifelike than the photographs of the amateur.

Only when the photographer conceals the labor of his efforts do we have true art in photography.—*Oak Leaf.*

Credit Reflects Character

Do you know that your character is judged by the way you pay your bills? Well, it is.

Prompt payment of bills tells the credit manager you are a man or woman of your word—a person of good character.

Lax payments indicate poor business methods and a disregard for the all-important business of character-building.

Promptness in meeting your obligations reflects honesty, good character and determination to maintain a sound standing in your community.

Credit men know and judge you by past performances and they have your record at their finger-tips.

To pay your bills promptly, therefore, means to keep your credit rating clear, your character rating unstained, your standing in the community unquestioned.

Good credit is an asset, a tremendous power, a thing to be highly prized and worked for. Once won, it must be zealously guarded. Each bill is a stepping-stone, so pay it promptly and lay the foundation of your credit structure surely and securely.

Pay your bills promptly—keep your credit good.

Anastigmat v. Rectilinear

ALTHOUGH this subject may appear to be a hackneyed one, yet certain aspects of the case that have cropped up in recent work raise points that may have not been touched on before. It seems to have been laid down almost as an axiom that the anastigmat will do everything that the R.R. will, and usually better, but that in the case of subjects that lie centrally on the plate and therefore do not call for keen definition at the margins the R.R. when slightly stopped down will give just as good a result.

These points seem so obvious that it may be useful to show that cases often arise which actually prove exactly the reverse. That is to say, that some subjects may call for the use of the rectilinear in preference to the lens of superior correction, while others cannot be satisfactorily photographed at all with the former, although they occupy only the center of the plate and require considerable stopping down.

Take for example an upright object which has detail all over the top surface as well as on its front, all of which has to be sharply defined. This calls for a rather high view-point to get the top detail, and still the back of the camera must be vertical to keep the upright lines correct. The lens, of course, is tilted as well as lowered as far as it will go, so as to include the bottom of the subject on the plate. The consequence is that the lens is often very nearly on a level with

the bottom edge of the plate, and that a large proportion of the image is formed by the extreme margin of its field. That is to say, that in the case of, say, a twelve-inch lens used on a whole-plate the actual subject falls nearly all on the one half of a sixteen-inch circular field.

It is well known that very few rectilinears will give quite critical definition at the margins, even when stopped down to the limit, so that for work of this exacting nature an anastigmat is a *sine qua non*. It is not merely a question of depth of focus, which a very minute stop will usually secure, but the trouble is due to want of corrections at the margins which, in the case of an R.R. stopping down will seldom cure entirely. Every anastigmat even is not entirely perfectly suitable. We think it may be accepted as a general rule that a lens made to work at a moderate maximum aperture will prove to give better marginal definition than one of the extra rapid type. It used to be the general custom for lens makers to give details in their lists of the sizes of plates sharply covered by their lenses when stopped down, in addition to those which the open aperture is suitable for. With the craze for high speed it seems to be forgotten that in the growing field of commercial photography one is often compelled to use the very smallest aperture provided by the makers. We have two lenses which we treasure particularly, in spite of their extraordinarily heavy mounting in obsolete shutters, simply because of the uncommon diaphragms which permit of stopping down far beyond the customary limit of $f/64$, and thus enable us to get results which otherwise would be impossible.

Having shown how certain classes of work require the very best of lenses to accomplish at all satisfactorily, it remains to balance matters by demonstrating that in the particular case of small interiors the old-fashioned wide-angle symmetrical will usually beat the more expensive instrument, and this apparent paradox is rendered still more paradoxical by stating that the advantage of the R.R. is more noticeable when time or light requires the largest possible aperture. This state of affairs is explained by the fact that in interior work one is less often concerned with a flat surface for which an anastigmat is suitable than with a corner formed by two sides of a room or possibly as much as possible of three sides is required, with more or less in the way of furniture standing about, so that the subject conforms very much nearer to a hollow curve which a rectilinear will render sharply. Some of the detail is certain to fall on the line which is rendered sharp on the plate at open aperture, while comparatively little in such a subject can be arranged to fall in one plane to suit the more highly-corrected lens.

While we are upon this subject we ought not to omit a reference to the usefulness of the rapid rectilinear lenses of long focus which represented the finest work of opticians in the pre-anastigmat days. Lenses of this kind of aperture, ranging

from $f/6$ to $f/10$, figure largely in the second-hand lists, and though their price has advanced substantially during the past two or three years, it is nevertheless a very great deal below that of an anastigmat of corresponding focal length. The latter certainly may have a larger aperture, but the experienced photographer knows that when he is handling a lens of focal length much above twelve or so inches a working aperture of more than $f/8$ is very little use to him. Quite apart from the suitability of the field of the R.R. for certain subjects, depth of focus of itself imposes the necessity of stopping down, often considerably below the $f/8$ stop. Thus the photographer who has occasion to make large-scale photographs of comparatively near objects or, on the other hand, to take views from an unusually distant standpoint, finds these long-focus R.R. lenses the most efficient and inexpensive instruments which he can include in his equipment.

These facts may serve to demonstrate that a well-selected battery of lenses, which does not necessarily mean a large number, is essential to the commercial photographer who wants to gain a reputation, not only for being able to do as good work as anyone else, but also for succeeding in getting good results where the other man's work will only just pass muster. It sometimes occurs that where a particular subject has been pronounced "impossible" by someone else, even a mediocre negative, improved by afterwork, may be found very acceptable by the customer.—B. J.

For the Man Who Writes Your Ads

When you have written an advertisement, read it over again, and then ask yourself:

Is it true?

Does it ring with sincerity?

Does it "knock" or even slur?

Has it too much novelty?

Is the language too flowery?

Is it grammatical?

Is the wording as direct and simple as it should be?

Does each word best express the meaning you want to convey?

Can any part of your text be misunderstood?

Are the punctuation and spelling correct?

Is there too much copy for the space?

Will your text of twenty-five words or fewer make the reader think of a hundred?

Does the illustration link up with the text?

Does it tell a story?

Does your "ad" as a whole have the atmosphere of the goods advertized?

Will it get your message across?

Will the type set-up and the general layout permit the text to be read easily?

Will the "ad" appeal directly to the audience you want it to reach?

In gauging the sales value of your text, have you put yourself in the reader's place?

Will it sell the goods?—*Publicity.*



ABSTRACTS AND TRANSLATIONS

BY E. J. WALL. F.R.P.S.



NAMIAS gives the following formulas for making printing-out papers and cards which may be useful to those who like to make their own materials:

Gelatin	25 gr.
Zinc chloride cryst	6 gr.
Citric acid	5 gr.
Ammonia	6 c.c.
Distilled water to	1000 c.c.

Soak the gelatin in half a liter of water, pour off excess of water and melt in a water-bath. Dissolve the citric acid in a little water, add the ammonia, then the zinc salt; add to the melted gelatin and make the bulk up to one liter; filter whilst warm. The paper should be immersed in this solution and hung up to dry.

The sensitizing solution is:

Silver nitrate	12 gr.
Citric acid	5 gr.
Glycerin	5 c.c.
Distilled water to	100 c.c.

This should be brushed over the surface of the paper with a soft brush, in gaslight, and the paper should be dried as rapidly as possible, if necessary by a gentle heat.

The tone of the prints with mere fixation is a reddish brown; but if tartaric acid be used, instead of the citric, a good dark brown is obtained.

Another sensitizer, which is slow in printing, is:

Silver nitrate	12 gr.
Distilled water	100 c.c.s.

This solution will keep a long time in the dark, and if 1 to 2 c.c. of a 5 per cent. solution of potassium bichromate be added the paper prints much harder.

A more rapid bath is

Silver nitrate	10 gr.
Uranium nitrate	5 gr.
Lactic acid	5 c.c.s.
Distilled water to	100 c.c.s.

Sepia tones can be obtained by the following bath.

Ammonio-citrate of iron (green)	20 gr.
Water	50 c.c.
Bichromate 5 per cent. sol.	5 c.c.

Dissolve and add

Silver nitrate	10 gr.
Water	10 c.c.

and add to the iron solution, and then add

Water to	100 c.c.
--------------------	----------

This solution does not keep very well and it is better to use it at once. The prints inten-

(354)

sify slightly when passed into water, and should be immersed in a 1 per cent. solution of oxalic acid, then washed and fixed in a 2 per cent. solution of hypo, not stronger or they are reduced.

Another formula is:

Ammonium chloride	0.4 gr.
Sodium citrate, neutral	4.0 gr.
Casein	4.0 gr.
Water	80 c.c.

Add the casein to a little water, heat gently, then drop in ammonia and stir well till the casein dissolves; then add the salts and the remainder of the water, and finally

Silver nitrate	7 gr.
Water	20 c.c.

The paper does not keep well but may be rendered more stable by immersing it, when dry, in a 3 per cent. solution of citric acid.—*Bull. Soc. Franc.*, 1920, 39.

Hurter Memorial Lecture

RENWICK recently delivered the Hurter Memorial Lecture before the Liverpool (Eng.) section of the Society of Chemical Industry. This lecture is an extremely interesting and useful summary of our existing knowledge of the subject.

Renwick pointed out that the position and shape of the characteristic curve of a plate is influenced by the range of sizes and sensitiveness of the grains and their relative proportions in the emulsion, the extent to which development is carried, the temperature and duration of the action of the developer and its rate of absorption and diffusion in and out of the gelatin film. It has been assumed that the amount of silver in a negative is a reliable index of the amount of photoproduct or latent image formed by exposure; but some recent experiments in which a deliberately fogged emulsion was added tend to prove that this is not strictly true. Another important point is the size of the emulsion grain and the developed grain, and although coarse-grained emulsions tend to give coarse-grained negatives, there is practically no connection between the two.

The theories as to the nature of the latent image may be practically divided into those which assume a purely chemical change and those which rely upon a physical change, practically the setting free of electrons from the silver halide atoms. It has, of course, been known for some time that by treatment of exposed silver chloride emulsions with a bromide the whole of the chloride could be converted

into the bromide and the latent image could be developed on the latter as well as on the former, but it has not been known that exposed silver bromide could be converted into silver iodide and successfully developed, for silver iodide *per se* is extremely difficult to develop. Renwick has, however, been successful using an alkaline amidol developer, which by the bye fogs silver bromide badly. The iodizing liquid was a 1 per cent. solution of iodide containing 2 to 3 per cent. of sodium sulphite and plates thus treated could be developed in white light.

Apparently the crystalline character of the silver bromide is changed by treatment with the iodide to the amorphous or microcrystalline state. The converted silver iodide can be reversed by light action, particularly by the blue rays between 430 and 450, and successful positives have been made in the camera with exposures of from five to fifteen minutes $\frac{1}{8}$ in a well-lighted studio. The best iodizing solution for reversal is sodium iodide 1, sodium sulphite, cryst. 2, hypo 2-4, water 100.

Renwick comes to the conclusion that in the most sensitive plates we are dealing with crystalline silver bromide in which, besides gelatin, some highly unstable form of colloidal silver exists in solid solution, and that it is this dissolved silver which first undergoes change on exposure to light. The paper should be read in its entirety to be appreciated.—*J. S. C. I.*, 1920, 156T.

Color-sensitizing Collodion Emulsion

VON HUEBL has again turned his attention to the color-sensitizing of collodion emulsions, and while this may be of little interest to the average photographer it is of some moment to the process worker. If the true isocyanins, pinaverdol, pinachrome and pinachrome violet are added to collodion emulsions the color sensitivity does not exceed four or five times that of a dry plate; but other dyes increase the color-sensitiveness from fifteen to twenty times that of a dry plate, and the most interesting of these dyes are pinacyanol, pinachrome blue, pinacyanol blue, dicyanine and ethyl violet.

To 100 parts of the mother emulsion are added 8 parts of a 1:1000 solution of the first-named dyes, and 2 parts of a similar strength solution of the second class of dyes. After the plate has been coated and the film set it should be washed to remove excess of dye, and it is during this washing that the color sensitiveness is attained, an unwashed emulsion gives very clean negatives but the color sensitiveness is low.

The sensitizing action is not alone traceable in the less refrangible rays, the red and green; but the sensitiveness of the emulsion to blue is actually better than that of the mother emulsion. The red sensitizers are particularly energetic; with pinachrome blue, for instance, the sensitiveness of the emulsion for white light is more than doubled, and relatively the sensitiveness to green and to red is greater than that of a gelatin emulsion with the same dye.

Winter has determined the sensitiveness of collodion emulsion, prepared according to von

Huebl's chloro-bromide formula, under various filters, using as a light source an electric lamp, adjusted as to its spectral light emission by special filter so as to approximate daylight, and his results are given in the following table:

Sensitising red.	Relative sensitiveness of the dyed emulsion to the colors.				Ratio of sensitiveness. Red
	Green.	Red.	Yellow.	White.	
Pinaverdol	2.3	0.3	2.6	4.4	0.14
Orthochrom-T	2.0	0.3	2.3	4.0	0.18
Isocol	1.4	0.4	1.8	3.5	0.30
Pinachrome	1.6	0.5	2.1	3.7	0.33
Pinachrome Violet	1.1	1.1	2.2	3.5	1.00
Pinacyanol	1.3	2.8	4.1	5.0	2.10
Pinachrome Blue	2.5	5.2	7.7	9.0	2.10
Pinacyanol Blue	0.8	4.2	5.0	6.3	5.00
Dicyanine	1.0	4.5	5.5	6.6	4.50
Ethyl Violet	0.5	0.6	1.1	3.0	1.20

It is quite probable that these results are clear to all; but to obviate any mistake, let us take the case of the pinachrome-sensitized emulsion. The sensitiveness to green is 1.6 times the initial sensitiveness to blue, and the sensitiveness to red is one-half the initial sensitiveness; but as the red plus the green gives by admixture the sensitiveness to yellow, which is slightly more, 2.1 times that for the initial sensitiveness to blue, the actual sensitiveness of the emulsion to white light being 3.7 times the sensitiveness of the emulsion to blue before dyeing; therefore, the sensitiveness of the stained emulsion to blue is the difference between the sensitiveness to white light and the sensitiveness to yellow, or $3.7 - 2.1 = 1.6$, the sensitiveness to green.

Various tests proved that the pinachrome blue is the best sensitizer, the ratios of sensitiveness being—blue 1, green 2.3, red 4.8. It would seem preferable, therefore, to manipulate such an emulsion in blue light, which is somewhat subversive of our usual procedure.

Collodion emulsion, sensitized with pinachrome violet, ought to be considered as a really insochromatic film; that is to say, equally sensitive to all colors, for the ratios are blue 1.0, green 0.9, red 0.9.—*Zeitsch. f. Repro.*, 1920, 10.

"Organic Photographic Developers"

By S. WEIN; published by Forty-Second Street Commercial Studio, New York. Price, \$3.50.

IN his preface the author states that "the following pages therefore constitutes (sic) an attempt to present to the busy chemist and photographer a concise chronological review of the literature of photographic developers." My advice to both classes is to let the book severely alone, for I cannot recall ever having perused a book with so many errors in it. It contains 128 pages in all, and is divided into two volumes, the first dealing with developers. The patents are in chronological order, but there is no indication what the patent is for, and one has, therefore, to wade through each one to find out what can be made by the given process. Chronological may be natural, but gathering all the patents dealing with one subject together

is much more satisfactory and saves time to the reader.

Four pages are sufficient to exhaust, according to the author, the patents on sensitizing and other dyes. The early German patents for making the isocyanin dyes, about twenty in all, are ignored, and even the U.S.P. patent granted to Miethe and Traube for ethyl red is said to be for pinacyanol.

Of the second volume, some 69 pages, the author says: "The following pages *is* (sic) a complete survey of all the chemical manipulations involved in photography." It is not, and is such a hotch-potch that I am compelled to think that the author is not a practical photographer. Here we are told that if a negative is too opaque it requires "reduction" or "bleaching," and unless the reader actually knows something of practical work it is impossible to make head or tail of the jumble, for one cannot see how to reduce by bleaching.

I am possibly oversensitive to typographical

errors, but when in a book of this size, only 128 pages in all, there are only 23 pages without typographical errors, even the average reader might object. In two cases, whole paragraphs of eight lines are bodily printed twice. The author seems to ignore the somewhat generally accepted rule of Lindley Murray that plural nouns require plural verbs.

The worst feature of the whole book is the gross errors that are quite misleading. For instance we are told that paramine is paraphenylendiamine hydrochloride, and it is not; nor is diamine a diamidoresorcin; nor paramol, paramidophenol. As regards the chemical formulas for developers, the author is hopelessly at sea; on one page, 24 are given and 10 are wrong. That the printer should ignore the usual conventional method of representing the benzol ring, or the Greek letters in compound rings, or the inferior subscripts, so that they are superior, is, of course, a matter of personal taste. —E. J. W.



The National Convention

As we go to press the National Convention is in progress at Milwaukee. A full report will be published in our October issue.

The Fourth International Photographic Salon, 1921

THE Fourth International Photographic Salon, under the auspices of the Camera Pictorialists of Los Angeles, will be held in the Gallery of Fine and Applied Arts, Museum of History, Science and Art, Exposition Park, Los Angeles, California, U. S. A., from January 4 to 31, 1921. The exhibition will be open from 10 A.M. to 4 P.M. (except Wednesday afternoons), and on Sundays open from 2 P.M. to 5 P.M.

The aim of the Salon is to exhibit only that class of work in pictorial photography in which there is distinct evidence of personal artistic feeling and execution.

All work submitted to the Jury of Selection will be carefully and impartially considered, but no picture will be eligible that has been previously exhibited in Los Angeles.

All pictorialists are cordially invited to contribute. Address all correspondence and entrance fee to Louis Fleckenstein, Room 31, Walker Auditorium, Los Angeles, California, U. S. A.

Instruction in Art Photography—Advanced Class October 7th, 1920, to April 7th, 1921

RECOGNIZING the broadening influences of artistic photography in portraiture, magazine

illustration, and as a medium of art expression, the Department of Photography of the Brooklyn Institute of Arts and Sciences has again secured the coöperation of Mr. Clarence H. White, of Columbia University.

This course will consist of fourteen sessions, beginning October 7, 1920, and ending April 7, 1921. The class will meet on the first Thursday evening in each month, at 7.45 P.M., and there will be seven Saturday afternoons at studio work.

Anyone interested in photography, living near New York and Brooklyn, will be well repaid by attending this special course, which is open to beginners as well as advanced workers. It is an unusual opportunity for all photographers.

The cost of tuition for members of the institute is \$10.00, and \$14.00 for all other persons.

Write for prospectus, giving full particulars. Address: The Brooklyn Institute of Arts and Sciences, Academy of Music Building, Brooklyn, N. Y., or Mr. W. A. Alcock, 346 Seventy-third Street, Brooklyn, N. Y.

Rochester Man's Invention to Revolutionize Retouching

BERT J. TIBBALS, photographer, of Rochester, N. Y., says *Abel's*, has succeeded after much experimentation in evolving a new negative modeling medium, soon to be distributed nationally. Its development was made possible by the discovery of a peculiar slag-like mineral substance found only in Brazil.

The main advantage of this modeling medium,

aside from the effective manner in which it will take down high light density and cut away outline contour which is undesirable in the finished print, is the fact that the surface left on the emulsion of the negative after as much of the metallic silver image has been cut down as required, leaves that surface as smooth as glass on which to do whatever retouching may be necessary. Etching with the knife always leaves a ridgy, uneven surface on the emulsion, so that when pencil work is introduced thereon, to cover up the marks left by the knife, it will always show a grain or stipple. This has to be spotted out in the print. A double chin or an over-plump arm may be entirely remodeled by the application of this medium, so that it will positively not show in the print. It will also leave a soft contour line, unlike the knife, which leaves a sharp, harsh outline.

The Fairchild Aerial Camera and Developing Machine

WE have received from the Fairchild Aerial Camera Corporation, of 17 West 42d Street, New York City, particulars of a most interesting camera and developing machine for use in connection with it. The camera is automatic in action and is intended for aerial mapping or oblique views. It is automatic in action and is driven by a motor actuated by a 12-volt storage battery mounted on the camera suspension, and can be used in a single-seater aeroplane. A roll film is carried in a detachable magazine, making it possible to carry any number of rolls and to change them while in the air. Each magazine has a capacity of seventy-five feet, enabling the operator to obtain 150 exposures, 13 x 18 cm. each. This is accomplished by an automatic equal-spacing device which does away with any wastage of film. The camera is entirely under control for regulating the interval between exposures, has a switch for stopping and starting the camera, or making it hand controlled only, and there is also a pilot light which flashes each time the camera takes a picture and a recorder giving the number of exposures. A Fairchild high-efficiency between-lens shutter is fitted with a range of exposure from $\frac{1}{200}$ th to $\frac{1}{2000}$ th of a second, and a 10-in. $f/4.5$ anastigmat is fitted as standard.

A smaller type of hand-held aerial camera for pictures 5 x 4, and for use with plates which are held in a magazine, is also available. This camera is fitted with a focal-plane shutter and an $8\frac{1}{2}$ -inch $f/4.5$ anastigmat.

The Fairchild daylight developing machine appears to be a remarkable piece of apparatus for dealing in a very speedy manner with the long length of film used in the larger camera. The machine is also motor driven and is arranged so that the exposed film is fed into it at one side from the magazine, and the negatives are developed, fixed, washed, dried, and delivered at the other side at the rate of one each minute, or, if the machine is speeded up and more concentrated developer used in the tank, one each twenty-five seconds. The interior of the machine is a series of tanks and rollers, the

film being entirely submerged until the washing is complete. The first tank contains the developer, the second a stop solution, the third and fourth fixing solutions, the fifth and sixth washing water (this is so arranged that running water can be used when available), and the seventh is the drying tank through which warm air is pumped. As the film emerges from the drying tank it is taken up as fast as it feeds out, passes over a shelf on which is mounted a cutting knife for cutting off the separate films as they appear. The machine occupies a space 15 x 42 x 60-in. and is light in weight.

The camera and developing machine, both of which are one-man instruments, are the invention of Mr. S. M. Fairchild, who designed them for practical use during the war, when speed in production of aircraft negatives was of the utmost importance.

Members' Work at the Camera Club

THE exhibition of members' work at the Camera Club, New York, which was held in the spacious galleries of that organization during the month of August, was the most successful, in the number of prints shown, their quality and in attendance and interest, that has been given for years.

Twelve pictures were selected by Mr. W. G. Bowdoin, art editor of *The World*, at the request of the print committee, and these will be hung permanently in the rooms of the Club. The list follows: R. A. Warrender, a harbor scene in a high key and a nocturne; Floyd Vail, F.R.P.S., a snow scene entitled, "A White Christmas," which was exhibited at the Royal Photographic Society's salon, 1918; Ben T. Luboshez, an interior of the Pennsylvania Railway Station; Miss Esta Varez, a figure study; F. E. Vail, a portrait; N. C. Owen, a space decoration; Miss Lorraine Harding, a portrait; John W. Allison, a beach scene, with nude; W. E. Wilmerding, a landscape; M. W. Tingley, a nude; and J. B. Tarbell, a buffalo head.

There were many other excellent exhibits by different pictorialists, among the best being those by Ned Van Buren; Sparks Frieman, Helen M. Murdock and H. A. Labiner, both of Boston; José Luis Requena, of Mexico; H. P. David, R. W. Burke, Mr. Bernstein, Edward Heim, Leonard M. Davis, M. Sugimoto, W. N. Capon, H. Galoupean; Dr. Krewder, Dr. M. Dagenhardt, Geo. W. Stephenson, F. S. Hastings, etc.

An Acknowledgement

IN our August issue, on page 331 of *The Workroom*, we published an article on "Making Enlargements from Film Negatives." This was reprinted from *Portrait*, and due credit should have been given. The omission was an oversight, which we regret.

Royal Photographic Society

At the meeting of the Scientific and Technical Group, on June 8, Sir William Pope presented the second of a series of papers by himself and Mr.

W. H. Mills on "Photographic Sensitizers." The "carbocyanines," considered in this paper are formed by the condensation of two molecules of a quinoldinium alkyl iodide in the presence of formaldehyde; they differ from the isocyanines previously described in that the two quinoline groups are attached at the 2,2' positions by the 3-carbon linking: CH.CH.CH., instead of by the simpler link: CH. at the 2, 4' positions, and also in sensitizing further into the red end of the spectrum. The best-known member of the group is the 1-1' diethyl compound, which is in use under the name sensitol red (German, pinacyanol). About 20 carbocyanines were described, variations being made both in the number, position, and composition of the substituting radicles, and the wedge-spectra of plates sensitized by them were shown in color on the screen. As in the case of the isocyanines, substitution in some positions has a considerable depressing effect on the sensitizing action. In the subsequent discussion Sir William Pope suggested that the essential characteristic of the carbocyanines is the 3-carbon linking, :CH.CH.CH., and not the position of connection to the quinoline groups.

Mr. G. I. Hogson described and exhibited a neat device for obtaining non-intermittent graded exposures of known values. The photographic plate is moved by means of a governed dictaphone motor under an opening of any desired shape; the actual speed of movement and any irregularities in it are obtained by means of an electrically operated time-marker, controlled by a metronome, which marks off definite time intervals on a smoked glass attached to the table which carries the plate.

Condensed Course in Motion-Picture Photography

EDITED by Carl Louis Gregory, F.R.P.S., Chief Instructor in Cinematography for the Government Signal Corps School of Photography, Columbia University. Large octavo, 382 pages. Fully illustrated with original photographs and diagrams. Cloth, \$6.00. New York, U.S.A.: New York Institute of Photography, 145 West Thirty-sixth Street, 1920.

THIS book has been carefully prepared and is published for the instruction of any one interested in motion-picture photography. It is a complete and thorough course covering fully every phase of the subject, and contains about 400 pages of text, in simple, concise language, and has 100 pages of illustrations.

The facts and data are important and the lesson-chapters are sure to be continually referred

to as an encyclopedia of camera man's information and as a complete authority and reference.

Special chapters were arranged by the Research Laboratories of the Eastman Kodak Company and by Charles W. Hoffman, formerly feature photographer for the Thanhouser, Edison, Pathe, World Film companies and for the United States Government.

Photographers' Association of the Pacific Northwest Tacoma, Wash., Sept. 14, 15, 16, 17, 1920 Convention

NEVER before has there been shown so much enthusiasm and interest in a photographic convention as at this time. The response with dues is unusually large, and if you have not sent in yours, do it now.

A report from the President, Mr. Evans, is to the effect that we will be granted a charter to the national association, thereby getting the benefit of the very latest and best work in our chosen art.

Convention Hall. We have been fortunate in securing the use of the large reception room and banquet halls of the Masonic Temple, which is centrally located.

Interesting Displays. At a recent meeting of the Executive Board it was decided to award diplomas and to give ratings on exhibits—six photographs 4 x 6 or larger—to our members.

Diplomas and ratings will be awarded by three competent judges; so get busy with your exhibit. We expect each member to contribute pictures for this exhibit. Notify the secretary when your exhibit will be ready.

Instructive Demonstrations. Displays and demonstrations from the principal manufacturers and dealers will be an enjoyable feature of this convention.

Question to be Voted Upon. Shall we choose one picture from each of the six exhibits securing the highest rating as a Salon picture to become the property of the Association?

Yours truly for a bigger convention.

FRANK J. LEE, Secy.-Treas.,
1535 Commerce Street, Tacoma, Wash.

Agent For Ica-Contessa and Carl Zeiss Products

MR. HAROLD M. BENNETT announces that he is sole agent in this country for the Ica-Contessa cameras and the optical products of Carl Zeiss. Mr. Bennett has handled the Ica cameras here with considerable success, and it is to be hoped that the new supply of these high-class and well-known goods will meet the constantly increasing demand.



The WORKROOM

CONTAINING THE LATEST PROCESSES, FORMULAE
AND APPLIANCES NEEDFUL IN THE ART OF
PHOTOGRAPHY FOR THE OPERATOR & WORKER

Miniature Photographs on Watch Dials, Porcelain,
Opal and Ivory of Exceptional Brilliancy
Home-made Backgrounds
Photographing Cut Flowers
Judging Density in Lantern-slide Making
Marginal Fog
Hydroquinone Caustic Developer
The Pyro Developer
Rapid Plates and Flat Negatives
Beginners' Difficulties in Bromide Enlarging
Home-made Transparency Plates
Dirt in the Dark-room
The Stereoscopic Photography of Small Objects
Detecting Pinholes in Camera Bellows
Paper Negatives
Photographic Materials and Processes



THE WORKROOM

By the Head Operator



Miniature Photographs on Watch Dials, Porcelain, Opal and Ivory of Exceptional Brilliancy

BY ALFRED J. JARMAN

EVERY photographic novelty has more or less value, and while some photographers do not care to bother with the unusual or novel things, there are others who take special delight in doing the things that seem difficult, and at the same time derive a considerable amount of profit from doing them.

The purpose of this article is not to sell an idea, however, but merely to give the process by which novel miniature portraits may be made by any one interested enough to go to the necessary trouble. One of the most common demands is for these miniature portraits on watch dials.

The first requisite for a miniature portrait is a negative of the exact size that the picture is to be made, and the negative must have considerable snap and brilliancy; a thin, flat negative cannot be used for the purpose. The negative may be an original, but is usually a copy of a good glossy print. It is less expensive to copy a good print, and the reduction is usually so great that the result is all that could be desired.

Use a process film or plate. If for any reason the picture looks best reversed, use a film and reverse it in the holder in making the negative.

Any good developer will answer the purpose if it produces snappy negatives. If your developer does not do this, retard it with a few drops of 10 per cent. bromide of potassium.

An excellent developer for this work is made as follows:

A	
Elon	120 grains
Hot distilled water	8 ounces
E. K. Co. sulphite of soda	360 grains

B	
Hydrochinon	120 grains
Hot distilled water	8 ounces
E. K. Co. sulphite of soda	360 grains

C	
Distilled water	8 ounces
Potassium carbonate	2 ounces

Keep the solutions in separate bottles and they will always be ready for use.

For use take A 5 drams, B 5 drams, C 9 drams and add 12 drops of a 10 per cent. solution of potassium bromide and 3 ounces of distilled water.

Develop in a clean tray, but keep the tray covered for at least half a minute. Full development will be reached in about one minute if exposure has been correct.

(360)

Any good fixing bath will answer, but the chrome alum bath recommended for films or plates is preferable. After fixing, wash the negative thoroughly and wipe it with a tuft of wet absorbent cotton; then dry it away from dust, as a miniature negative must, above all things, be clean.

As this is a transfer process a suitable paper must be prepared for printing the photograph so that it may be stripped from its support. Procure a few feet of baryta-coated paper, such as is used for coating with glossy photographic emulsion; if this is difficult to obtain, any good paper will answer if it is given time in the coating to take on a good coating of the soluble stripping mixture. Cut this into pieces about $6\frac{1}{2} \times 8\frac{1}{2}$ and roll them so that the baryta coating faces outward. Prepare the following solution, which will give an easily soluble base when placed in warm water:

Soluble Stripping Mixture

Soft gelatin	360 grains
Granulated sugar	120 grains
Water	12 ounces

Place the gelatin in the water and let it soak for half an hour. Add the sugar, and heat the mixture until the gelatin is completely dissolved. Stir well, add half an ounce of a 5 per cent. solution of carbolic acid and then strain through a piece of washed muslin. Pour this mixture into a clean 8 x 10 enamelled or glass tray, the temperature of the mixture being at about 90° F.

Place a sheet of the baryta-coated paper face down on the solution, by holding it at opposite corners so that the middle of the paper touches the solution first, then lower the corners so that the paper floats upon the surface. The solution must not be allowed to run over on the back of the paper.

The corners of the paper should be carefully lifted, one at a time, to see if there are any air-bubbles upon the surface of the paper. If there are any, break them with the tip of the finger, rub the spot lightly and carefully lower the paper again. It may now be lifted from the solution and one corner drained against the side of the tray. The coated paper may now be pinned against the front edge of a shelf to drain and dry in a place that is free from dust.

As soon as the coated paper is dry the lower thickened edges may be trimmed off and the sheets placed under weight, where they will be kept flat until ready for use.

This paper will keep almost indefinitely previous to sensitizing.

Sensitizing the Paper

Six small bottles will be required for making the sensitizing solution, three of them being five-ounce amber-glass bottles.

SOLUTION A

Pyroxilin (soluble cotton)	40 grains
Pure photographic alcohol	2 ounces
Sulphuric ether	2 ounces

SOLUTION B

Recrystallized nitrate of silver	120 grains
Distilled water	2 drams

The above quantity of silver will just dissolve in the two drams of water.

SOLUTION C

Pure alcohol	1 ounce
Chloride of strontium	32 grains

SOLUTION D

Citric acid	32 grains
Pure alcohol	1 ounce

Shake the A mixture until the cotton has completely dissolved. Pour this into a five-ounce amber-glass bottle and add in the exact proportions: Thirty drops of B in one dram of pure alcohol. Shake the mixture well. Then add one dram of C, a few drops at a time, shake well, and finally add thirty drops of D and shake well. Let the mixture stand for half an hour, then filter through a small tuft of absorbent cotton into another five-ounce amber-glass bottle. All these mixing operations must be under a yellow light.

When the filtering is complete the mixture will be ready for use. It will keep in good working condition for a month.

To coat a sheet of paper, turn the edges over for a quarter of an inch upon a flat ruler so the sheet of paper forms a shallow tray. Cut a piece of stiff cardboard a little larger than the folded paper, and stick each corner to the cardboard with a touch of sealing wax. Bend down the opposite corners so that lips are formed. Now, under a yellow light, pour a pool of the sensitizing mixture into the paper tray and allow it to run to each corner quickly, and drain the excess into the bottle it was poured from, by one of the lips. In this operation the entire surface of the paper should be covered with the solution. Rock the paper tray to secure an even surface, then pin it by one corner to the edge of a shelf to dry, which will take about ten minutes. Re-coat the paper in the same way, pouring on the sensitive collodion from the opposite corner, pouring it off and rocking the tray to give a perfectly even coating. Pin up to dry from the opposite corner, away from actinic light and dust.

Printing, Toning and Fixing

Printing is the same as for any printing-out paper, by a strong artificial light or by sunlight. It is important to have perfect contact, so a good pad should be used in the printing frame. Printing should be about two shades darker than is required for the finished print.

When the prints have been made, place them in water for about a minute and then place them face down on a piece of clean glass, squeegee out the water and allow them to stand for twenty minutes. This is to take the curl out of the prints before they are toned. Then rinse in four or five changes of water, keeping them flattened as much as possible, when they will be ready to tone. If prints are very small the curl will not be enough to cause much trouble and the flattening process may be eliminated.

TONING SOLUTION

Water	16 ounces
Chloride of gold	3 grains
Saturated solution of borax	1½ ounces

This toning solution should be made up and allowed to stand at least an hour before using. Prints should be toned long enough to at least clear the highlights. Long toning will give more of a blue color and will require slightly darker prints. The toning solution can be bottled and used again and may be strengthened by the addition of gold and borax when necessary.

Fix the prints in a plain hypo fixing bath, 1 ounce of hypo to 10 ounces of water. Under no circumstances should an acid or alum fixing bath be used. Fixing will be complete in two or three minutes, when the prints should be washed in half a dozen changes of cold water, allowing a minute or two between changes.

For watch dials the miniature photograph should be cut to the size required after printing and before toning and fixing. If the print is to be an oval or circle it should be cut pear-shaped so there will be a handle by which the print can be held without touching the picture. This tailpiece can be cut off at the time of transfer.

When the print has been toned, fixed and washed, wet a piece of smooth writing paper that is fairly thin and place it in contact with the print and rub down carefully between blotters.

The watch dial having been thoroughly cleaned by washing with warm water containing a little washing soda, rinsed and dried, is ready for the transfer.

A pair of tweezers will now come in handy. Grip the print with its plain paper covering at the extreme edge, but so the two will be firmly held together. Dip into warm water, about 90° F. (but not over 100° F.) and take it out immediately. Dip again and carefully drain the excess of water against the edge of a torn blotter. Lay the print on the blotter and carefully slide off the original paper support, leaving the print on the temporary support. The sugar-gelatin readily melts and leaves just enough adhesive material upon the surface of the print to stick it to the dial.

The print may now be placed in contact with the dial and a small piece of blotting paper used to carefully rub it down. From one corner the temporary paper support is slowly lifted away, leaving the print on the dial. The picture is now left to dry, when it is flowed over with a solution of white gum arabic. The entire dial may be flowed or the gum may be placed on the print with a brush, extending the covering just beyond the edges of the print. It is then allowed to dry

again. The gum arabic solution is made as follows:

White gum arabic (in gum tears)	1 ounce av.
Distilled water	8 ounces
5 per cent. solution carbolic acid	$\frac{1}{2}$ ounce

This solution must be strained through a piece of well-washed muslin to make it free from dust or grit and used when quite clear.

As soon as the gum coating is dry the picture may be coated with Kodak W. P. to waterproof it.—*Photo Digest*.

Home-made Backgrounds

SOME form of evenly tinted background is a great convenience to the portrait worker, who has not a plain wall in the room in which his work is done. The background with a painted pattern on it is a thing best left to the professional; it is generally incongruous and sometimes positively absurd. The same objection does not apply to the plain ground, which does not purport to be anything in particular, and simply provides a smooth expanse of tone behind the sitter; and it is a background of this character which is likely to be most serviceable to the amateur who wishes to make half-length portraits of his friends. For full-length figures it is better to dispense with a background and to use natural surroundings.

Extemporized backgrounds of brown paper, blanket, or a similar kind are only really satisfactory if they can be thrown so much out of focus that their temporary and makeshift character is no longer apparent. It is surprising how difficult this is with the comparatively small stops and short-focus lenses in use by the amateur. Try as we may, the print will nearly always have some change of tone on it to hint at a crease or a wave, which "gives the show away." The only dodge that can be relied upon in such a case is to make use of the services of a friend to keep the background in motion during the exposure: and this is not always possible.

On the whole it is much better to have a background specially made for portraiture, and one that is kept permanently stretched on a frame. With the rollable backgrounds the vertical edges invariably curl to some extent, and one has to have them a good deal wider than is actually included in the picture in order to exclude these edges.

It is quite an easy matter to make a background at home which will serve as well as, if not actually better than, a bought background. The material may be any fabric which can be bought sufficiently wide to make the background without a join: unbleached sheeting is generally the cheapest that is obtainable in a good width.

It will be gathered that a join is undesirable; but if this cannot be avoided it may be made almost unnoticeable even when the background is dead sharp, and quite unnoticeable when it is a little out of focus, as in good portraiture it is sure to be. To accomplish this the seam should be vertical, not horizontal, and it should be made and ironed out quite flat before proceeding to stretch the background on its frame.

The first step to take, when the material has been obtained, is to construct a framework on which to stretch it. This is made of battens, which, for a size likely to be used by the amateur, may be $2\frac{1}{2} \times 1\frac{1}{2}$ or even 2×1 in. The ends must be halved and let in to each other so that the frame has a flat surface all round. Thinner battens may be nailed across diagonally at the back, or strips of matchboard two or three feet long may be used for the same purpose. The corners should be carefully squared up before these stays are fastened. When the background has been painted and is quite dry they can be removed, as the need for their presence will have gone by.

An alternative method is to let in the stays so that they also are flush with the frame. They can then remain permanently in position, and a second layer of fabric can be put on the back and given a different tint. This is better than giving the back of the one fabric a tint of its own, as the frame is apt to get in the way, both when painting the fabric and afterwards when the background is in use.

When the frame is made it is laid flat on the floor and the fabric is stretched on it. The first step is to spread out the material as evenly as possible, so as to see how it is coming, and then to fasten it to the frame by tacks inserted in the middle of two opposite sides. The material is folded over and fastened along the edge, not on the face of the background. The centres of the two other edges are then fastened in the same way. The material should be pulled tight enough to make it flat, or with only a slight sag in the middle as it lies on the ground; it should not be violently strained, as if any great force is used there is likely to be trouble in avoiding any wrinkles on its surface.

When the centres are made secure the tacking may proceed outwards in both directions from each until the corners are reached, pulling the fabric just tight enough to avoid any folds. The frame can then be raised into a vertical position for painting, and the background should appear without a single wrinkle on its surface. It is well to let it stand on some sheets of newspaper spread out on the floor, as it is impossible to do the sizing and painting quite without splashing, and the splashes of either are very difficult to clear up.

Before applying the distemper, which is the most convenient form of paint for the amateur, it must have a coat, or even two, of size. Size for the purpose can be obtained from the oilman. A couple of pounds should be put into a bucket, and half a gallon of boiling water over it, when the greater part of it will at once dissolve.

A cloth, wetted in hot water and wrung out, is then put over the top of another bucket, and the size, having been well stirred up, is poured on to the cloth, to strain out any particles of dirt or skin. Then, with as large a whitewashing brush as is available, the size is well brushed into the material, starting at one top corner, and working gradually outwards, not merely flooding the surface, but applying sparingly and working it well into the fabric. When it is complete it must be left to get perfectly dry. When dry,

the size may be warmed up again and a second coating given, although this is not absolutely necessary.

The paint may be either plain whitewash, or whitewash toned down to a gray; or we may use one of the ready made distempers which are obtainable in tins ready for use. We have used "Hall's Distemper," which is of a very fine even character and answers very well for this purpose. It can be obtained in a great variety of tints, although none of them are very dark; and if a very dark shade is required, black must be added to the distemper as described in a subsequent paragraph.

If whitewash is used, a couple of balls of whitening should be put into a bucket, covered with hot water, and stirred up with a strip of wood to make a smooth cream. If it is to be toned down in color, finely powdered bone-black or other powder color, which is also obtainable from the oilman, is added and well mixed in.

The actual color of the background is, in a sense, of no importance. What is of importance is the depth of tone which it will possess when photographed. Whether this is obtained with a pigment of a warm (reddish) or of a cool (bluish) shade, only matters in so far as it may mislead the photographer, when arranging his subject, into the belief that the background will come out lighter or darker than proves to be the case. Bluish colors photograph lighter, reds usually show up darker; but some pinkish reds photograph unexpectedly light. Neutral grays are in this respect the best, whether for light or dark backgrounds.

The mixing must be very thorough; and, with some colors, it will be necessary to strain the mixture through a cloth to ensure freedom from lumps. The shade must be tested by smearing a little on a piece of wood or card, and letting it dry as the tint when dry is very much lighter than it is while wet. When the mixture is what is required, some of the warm size and water, similar to that already applied to the fabric, is added, in the proportion of a quart of the size to a pint of the cream. It is thoroughly stirred to incorporate size and color, and then left to go cold. When cold it should set into a thin jelly, in which form it can be applied to the stretched material.

The painting is done in exactly the same way as the sizing. The brush after sizing should have been well washed in warm water and allowed to dry. Dipping it into the jelly, which will be found to work up into a kind of liquid condition under the brush, it is applied in a series of strokes, first downwards and then across, so that brush marks are almost obliterated. It should be used sparingly, only dipping the brush in the bucket again when it has reached the stage that it ceases to leave any color on the fabric.

Most failures are due to an attempt to substitute a lavish use of the whitewash for the necessary work of brushing it evenly. Slight brush marks will vanish as the coating dries. After a day or two it will be quite dry and may be handled; but, until it is absolutely dry, any touch on the moist surface will leave a permanent mark.—C. E. T.

Photographing Cut Flowers

WHEN we undertake to photograph flowers in our gardens or out in the fields we must accept conditions as we find them. If the wind is blowing we must await its pleasure, for flowers nod responsively to every breeze that blows.

But in photographing cut flowers or potted plants we can control the conditions, for we can take their pictures in any well-lighted room, where we can arrange the flowers and the lighting to suit ourselves.

The secret of success in indoor flower photography will be found in the right lighting and the use of a suitable background.

One of the simplest and most satisfactory ways to light flowers that are to be photographed in the house is, to place them a few feet from a window, with a reflector, which may consist of a sheet of white cloth or white paper, placed so that it will reflect light to the side of the flowers that is farthest from the window.

White flowers may be photographed directly opposite a window, if desired, but they can usually be pictured more satisfactorily if they are lighted in the way that all flowers that are not white should be, that is, they should be so placed that the light from the window will reach both the front and one side of them. This lighting can be obtained by any window that is to one side and a little in front of the flowers.

The light should come downward as well as from the side, at an angle of about 45 degrees, so that the strongest light on each flower will be near the top of it.

The background must photograph either lighter or darker than the flowers or they will be invisible in the picture. Should red flowers, which photograph black, be pictured against a black ground, or should white flowers be pictured against a white ground, the result will be a total failure. On the other hand, should red flowers be photographed against a white ground and white flowers against a black ground the result, in both cases, will be a picture showing the flowers clearly outlined against the background.

Flowers not only vary greatly in color, but different flowers on the same plant may show different tones or shades of the same color, and, when in doubt about the tone (white, gray or black) in which they will photograph, and also when a group of different colored flowers is to be photographed, it is wise to use a background that will photograph gray. In fact, such a background will usually prove satisfactory for flowers of all colors, and it need consist of nothing more than a wide sheet of ordinary tan-colored wrapping paper free from wrinkles.

Whether to use a filter or not will depend on how the flowers will photograph, with and without a filter.

When no filter is used, white and light blue flowers will photograph white. Dark blue flowers will, usually, photograph gray; light green and pale yellow ones will also photograph gray; dark green and deep yellow ones will photograph quite dark; while orange and red flowers will photograph black.

Blue will photograph darker and yellow

lighter with a Kodak Color Filter than without it. A Wratten K2 filter will make blue photograph somewhat darker and yellow quite a bit lighter than the Kodak Color Filter does. Both filters will slightly lighten the rendering of orange, but neither will have any effect on the rendering of red, which will always photograph black, unless a special plate that is sensitive to red is used.

Those who have photographed red or orange or yellow flowers and have found that some parts of the flowers were rendered white while other parts were rendered black in the pictures, may have wondered how this happened. This sometimes occurs with flowers that have glossy or wax-like petals. All glossy surfaces, no matter what color underlies the gloss, will reflect white light, and the way to avoid getting these black-and-white effects when photographing glossy petaled flowers is to light them so that the light on the shadow side will be nearly as strong as the light on the window side of them; then be careful not to over-develop the negative, and in printing make the print on Special Velox.

By using a Kodak Portrait Attachment the fixed-focus box Brownies and Premos can be placed as close as $3\frac{1}{2}$ feet from the flowers, and the folding Kodaks, Premos and Brownies can be placed as close as 2 feet 8 inches from them. The closer the camera is to the subject the larger will be the image of the subject in the picture.

A filter can be used in front of a portrait attachment when desired. If both filter and portrait attachment are mounted in cells which slip over the hood or flange of the lens, the front of the filter cell should be placed in contact with the front of the portrait attachment cell, and the two bound together with adhesive paper or tape.

When this is done the two cells will look exactly alike, and a pencil or penknife mark should be placed on the filter cell, to make sure that the filter will always be used in *front* of the portrait attachment. Unless the portrait attachment is placed next to the lens, with the filter in front of it, the picture will be blurred.

The exposure to give cannot be definitely stated, as this will depend on the light conditions and the stop used, but the writer has always obtained fully timed negatives, when the flowers were not more than 3 feet from a window through which no sun was shining, between the hours of 9 and 4, by giving an exposure of from one to two seconds, with stop 16.

With a Kodak Color Filter the exposure must be about 10 times as long, and with a Wratten K2 Filter it must be about 20 times as long as would be needed without a filter.

These factors of 10 and 20 are calculated for rendering the same amount of shadow detail as will be secured with exposures that are, respectively, $\frac{1}{16}$ and $\frac{1}{20}$ as long without a filter.

Judging Density in Lantern-slide Making

It will be found a great help (writes Mr. H. P. Freeman in *Photography and Focus*) to have a

uniform light by which to judge the slides. One skilful amateur photographer of our acquaintance, who makes many slides, has a little dark-room lantern which he keeps for this special purpose. It contains an oil lamp, and has a piece of opal glass backed up by a deep yellow light-filter. The lamp glass is masked so that its opening is only $3\frac{1}{4} \times 3\frac{1}{4}$ inches, and against this each lantern-plate, as it is developed, is carefully examined. Being in his dark-room recently when slide-making was in progress, we noted also that he did not worry to look at the slide in the early stages of development at all, keeping the dish covered and rocking it occasionally until the process was very evidently nearing completion.

With highly restrained developers for very warm tones, it is well, we find, to supplement any examination of the slide by looking through it, by taking the temperature of the solution and the time of development. In this way, if on fixing the slide it should be apparent that an error in development has been made, it is an easy matter to make another, with the note which we have made of the time of development supplementing any conclusion which we may draw from looking at the slide.

Marginal Fog

It sometimes happens that the excessive taking of precautions is the cause of defects in negatives which would never have occurred at all to a more happy-go-lucky worker. We had an instance of this the other day in some negatives which were shown to us with the suggestion that they were due to stale plates as evidenced by the narrow band of fog along the edge. We did not agree, because in the first place the fog had not the dichroic appearance which is usually associated with staleness of the emulsion, and in the second place it occurred only on two sides of the plate. While it is admittedly possible that the packing of plates may be such that they suffer on two edges only, it is rare for this to be the case, and we sought other causes for the phenomenon. We found it in our friend's camera, a heavily built landscape instrument with the back frame of rather more than ordinary thickness. A glance at the interior showed that the portions of this back frame adjacent to the plate, when the latter was exposed to the lens, were about as shiny as they well could be. Inquiry showed that it was this worker's practice to rub the entire inner woodwork of the camera with a duster before taking it out for use, with the result that what originally was a dead black surface had been rubbed up to quite a respectable polish, and one which, according to the subject, was capable of reflecting a narrow band of light upon the edge of the plate. Reflections from the inner woodwork of a camera are responsible for more markings on plates than many perhaps realize; and one of the things which may well be done every few months is to touch over wood or metal surfaces which can possibly come within the field of the lens with a little dead black.—B. J.

Hydroquinone Caustic Developer

THIS is the favorite developer for line work, but certain precautions are needed in its use. Forcing nearly always results in a deep brown stain, and so sometimes does omission to rinse the plate well between developing and fixing. For regular work of good quality a fixed time of development at a certain temperature is almost a *sine qua non*, and the temperature in no case should be below 60° or over 75° F. A further point is that the developer should not be used more than once. This may seem wasteful, but I have proved it to be the only reliable method of working.

It may not be generally known that his developer can be used to make a rich bromide print from a flat negative. This extra contrast is not so great as is obtained when gaslight paper is used, and the hint is therefore more likely to be of use in enlarging than in contact printing. Here again the developer can be used once only. Therefore small trial slips should be made, and then the final print well wetted and rained, so that a small quantity of developer can be used for it.—B. J.

The Pyro Developer

THERE is a prevalent idea that the various developing agents, such as pyro, hydroquinone, metol, and amidol differ widely in their action, and that each will only produce a certain class of negative. A little experimenting will prove that this is true only to a very limited extent, if at all, as it will be found that images of almost any desired character may be obtained with the same developer. Metol, without the addition of hydroquinone is reputed to give soft images, tending to flatness, but if sufficiently concentrated and allowed to act long enough, black and white line negatives may be obtained. The fact is, as pointed out by Mr. Watkins, that the ratio of the time which is needed for the appearance of the image and that needed to attain the required degree of density varies greatly with different developers, and this has led to the impression that what are generally called long-factor developers give thin images while short-factor ones give strong ones.

What we may call flexibility in a developer is a valuable quality, that is to say, it is easy so to modify the solution that thin or dense images may be readily obtained without unduly prolonging the time of development, and this quality is, we believe, present in pyro-soda to a greater extent than in most other developers.

In considering this subject we must keep in mind the elementary fact that the degree of contrast in a correctly exposed negative is directly controlled by the period of development, and by varying this we may obtain anything from a mere ghost of an image to one which is too hard for any ordinary purpose. There is, however, a slight departure from this rule when the solution used contains bromide, as the action of the developer upon the darkest parts of the subject is delayed in a greater degree than it is during the earlier stages of development upon the highlights. If the image be developed "right out" or

until all the exposed silver bromide has been reduced, the effect of bromide is practically nil.

In the ordinary way no bromide solution is necessary or desirable with pyro-soda, but, when used, its action is most energetic, a very small quantity being sufficient to have a marked effect. This quality is what gives pyro-soda its long range of contrasts, which, we believe, practically exceeds that of any other developer, especially if we take into consideration the variation in the color of the image which may be produced by using more or less sulphite. While mentioning sulphite it must not be forgotten that the quantity of sulphite should be in proportion to the bulk of solution used and not to the pyro present, that is to say, if a normal developer contains 16 grains per ounce of sulphite, it should, when diluted to any extent which may be desired, still contain 16 grains to the ounce, if the same immunity from stain is to be secured. This is easily done by using a plain sulphite solution of this strength instead of water only. It is a common error to attribute staining with dilute developer to the increased time of immersion, as may easily be proved by developing the halves of a cut plate for the same length of time in full strength and dilute solutions respectively. There will, of course, be a great difference in density, but the stain in the shadows will be much more marked in the part treated with the weak solution.

As with all developing, the action of pyro-soda is greatly affected by temperature, and much uneven work is caused by neglect of this point. All systems of tank development call for the use of the thermometer, but with dish development there is often a tendency to cut the operation short, under the impression that no more action can take place. This is more pronounced with some makes of plate than with others; some brands which give vigorous negatives at a temperature of 60° F. yield but thin ones, even with a much longer treatment in the same solution at 45°. If possible such low temperatures should be avoided, but if this cannot be done development must be prolonged as long as may be necessary. Density should never be judged by the appearance of the image on the back of the film. We have known plates to be rejected because, although the image appeared clearly on the back, it appeared thin after fixing. In such cases longer development will give greatly increased density.

When any considerable difference in density is required it is usually preferable to vary the strength of the solution rather than to trust to very short or very long periods of immersion. If thin images are required a developer of half normal strength will, as a rule, give more even results than short treatment with a normal solution, while to obtain a vigorous result from a flat original, one double the normal strength may be used with advantage. In the latter case it is advisable to add a little potassium bromide to prevent the appearance of chemical fog, which is liable to occur with some emulsions. When such variations in strength have to be made it is convenient to keep the pyro and soda in concentrated stock solutions, which may be of such strength, that one dram of each and six

drams of water form the normal developer. A double strength solution may then be obtained by taking two drams of each and four drams of water for each ounce. This cannot be done where the ordinary practice of making up an ounce of pyro and the prescribed quantity of soda up to 80 ounces each and using without dilution; such a developer can be weakened easily enough but cannot be strengthened; moreover, such weak solutions do not retain their activity as well as those which are more concentrated.—*B. J.*

Rapid Plates and Flat Negatives

DURING the last few years the standard of speed for plates used in studio work has been steadily growing higher, and 400 H. and D. is now regarded as nothing exceptional. The old prejudice against very sensitive plates has almost ceased to exist, but there are still many operators who seem to think that although very rapid plates will yield images full of detail, they cannot be expected to give the brilliancy usually associated with slower emulsions. We do not propose to consider the scale of tones which any particular plate or plates will render correctly, as in practice any plate now on the market will fulfil all average requirements quite satisfactorily, but to indicate as far as possible the way to secure plucky results with short exposures.

It should be, but is not always, recognized that a plate which is very sensitive to the light transmitted by the lens is also highly susceptible to any other light which may happen to reach it at any stage between opening the package and fixing the negative. A very little fog frequently gives an impression of overexposure with short development and a muddy slow printing one, if carried to full density. One of the most common causes of flatness is diffused light in the camera, and it is curious that concurrently with the increase in plate sensitiveness the precautions formerly taken to avoid fog have gradually been abandoned, although they are now more than ever necessary. One of the most important of these is a shade or deep hood for the lens, which is usually absent on modern rapid lenses as well as upon most studio cameras when sold. A great many operators fix up some sort of shade for their own use, but it is rare that a really effective one is seen. A good test for any method of lens shading is the making of "Rembrandt" portraits, in which the light is shining almost directly into the lens, illuminating the inside of the tube and the surfaces of the glass as well as the bellows and woodwork of the camera. It will be found that to secure freedom from fog in these conditions it is absolutely necessary to screen the lens by means of a dark card or curtain having in it a rectangular opening which only allows the rays passing from the sitter and his immediate surroundings to reach the plate; that is to say, that if it be desired to take a cabinet portrait with a 12 x 10 camera only, an area a little larger than a half-plate should be seen upon the ground glass, the remainder being more or less vignetted off. As no light reaches the sides of the camera the color of the interior of the bellows does not greatly matter, but it is advisable to give a coat

of dead black occasionally, instead of tolerating the medium gray tone which most bellows assume with long use.

A very slight cloudiness on the surfaces of the lens will cause a considerable amount of fog upon the negative, and as it is not advisable to wipe the surfaces too often, both front and back surfaces should be protected by caps or other coverings when not actually in use. During the recent foggy weather a single day's exposure to the atmosphere would be enough to dim almost any lens, yet many are left for weeks at a time with only an occasional polish to the front surface. Now that caps are seldom used the lens is usually freely exposed to light and fog, and it will be as well to remember that much of the glass which has been used in the manufacture of rapid anastigmats is far more susceptible to the action of light than the old flint and crown of the Petzval portrait lenses.

Fogging caused by unsafe illumination in the dark-room is easily recognized, as it extends over the margin protected by the rebate of the slide, while with camera fog the margins are clear. A light which may be "safe" with a 200 H. and D. plate, which attains proper density in two and a half minutes, may be very risky with a 400 H. and D., which requires double the time in the developer to yield the same strength of negative.

Thinness of image, which gives an impression of flatness, often results from insufficient development when using very rapid plates. A very simple experiment will prove whether a plate is capable of giving a sufficiently plucky image. Two plates of similar make should be developed in the same dish, one for the time usually allowed and the other for twice as long, without reference to its appearance. In most cases the difference in contrast will be very noticeable. Referring to this, we may instance a recent test where twelve plates having received identical exposures were distributed among the members of a small society for development and subsequent comparison. The results ran the whole gamut, from a thin image full of detail but incapable of giving even a decent gas-light print, to a strong contrasty one which required treatment with persulphate before it could be used even for carbon. Each member had treated the plate by methods which had, with other brands, given him satisfactory results.

Rapid plates are naturally most in demand in the winter; or perhaps we should say that it is usually in winter that the change from a medium to an extra rapid plate is made, and it is at this time of the year that there is the greatest amount of suspended matter or fog in the atmosphere. The eye becomes so accustomed to it that its presence is hardly realized, but it is none the less there, degrading the shadows on the photograph. If we protect a beam of light from a magic lantern or even a pocket torch in an otherwise darkened room, we can see the suspended particles in the form of haze, for in clear air the path of the rays cannot be traced. It is therefore important that the space between the lens and the sitter should not be illuminated more than is absolutely necessary, especially when working with artificial light, and for the same reason the lens should be of no greater focal length than is absolutely necessary. A rough method of estimating the amount

of fog in the studio is to place a crumpled black velvet cloth in the position usually occupied by the sitter. Then, standing by the camera, hold up a similar cloth a few inches from the eye so that the edge cuts across the distant velvet. It will be found that the deepest shadows on the latter are more or less gray and the effect of screening off intervening light can readily be seen. Only after all the foregoing precautions have been taken can we accuse rapid plates of giving flat negatives.—*B. J.*

Beginners' Difficulties in Bromide Enlarging

It has fallen to the writer on many occasions to give instruction and advice to persons taking up bromide enlarging both among professional and amateur photographers. The difficulties experienced and the character of the unsuccessful results often obtained at first are almost always alike, so that a few hints regarding these may be acceptable to some who are commencing in this branch of photography. A perusal of these notes may save such a good deal of the disappointment and waste often occurring.

The difficulties referred to are quite few, and it is not proposed to enter into the hundred-and-one details of process and apparatus, as these are well covered in several shilling manuals on the subject. The two principal troubles met with are: Firstly, flat results, which will not compare in quality with contact prints from the same negatives; and, secondly, a want of evenness of the illumination on the easel, which will probably show itself in the enlargement, especially in the case of groups which would in that state of affairs come out with some of the faces noticeably lighter or darker than they should be.

There are a few other difficulties which may be found troublesome and puzzling when they occur to the uninitiated, but which are quite easily overcome. These minor troubles are: blisters, white specks in lines or groups, and a doubled image.

Taking each of these points separately, a flat-looking result may be caused by fog—that is, by light other than that forming the image acting on the paper. If this should be the case no part of the sheet will be white, and the most probable cause would be an unsafe dark-room lamp. Bromide papers can be handled, of course, in a much brighter light than plates, and in most cases two thicknesses of "Canary fabric" should suffice to make the light safe. There should be as bright a light as possible consistent with safety, so as to see the development of the prints with comfort and ease. To test the safety of the light place a small strip of bromide paper at about two feet from the lamp with a coin or other opaque object lying on the sensitive side. Leave it exposed to the light for two minutes and then place it in the developer for the same length of time, and if an outline of the object can be seen another thickness of the yellow fabric should be placed over the light.

If an "M. Q." (metol and hydroquinone) developer be used, its temperature should not be allowed to fall below 60° F., as the hydroquinone will then not work properly and weak images only will result. The best temperature for the

developer of whatever variety is about 65° F. Stale paper is occasionally the cause of poor results, and care should be taken to obtain supplies from a reliable source, and if a reasonable doubt be entertained that faulty results are due to bad paper a piece or two should be sent to the manufacturer along with one of the spoilt prints and the outside wrapper bearing the "batch number."

The most usual cause, however, of flat enlargements is overexposure, coupled with underdevelopment. A good average bright negative should be chosen, such as will give a nice contact print in any ordinary process, and placed in the lantern to make the first attempts. Having focussed the image, a few strips of bromide paper should be cut to avoid wasting whole sheets, say about 6 in. x 1½ in., and one of them pinned up and exposed. No guide can be given, as lights, negatives, and papers vary enormously, and so in each installation the first one or two trial exposures can only be done by guesswork. The trial strip should include a bit of the densest part of the negative in which detail is wanted and a bit of the thinnest, as well as some shades in between. After exposure, the strip is placed in a dish of developer, which is kept gently moving. The image should come up gradually and take not less than one minute, but one and a half to two minutes would be better. If the lightest detail comes up before one minute, or if the picture grays over quickly, the exposure has been too full. On the other hand, if the picture is not at its full strength in two minutes more exposure is required. At first all "trials" should be given a good minute in the developer until one becomes able to judge from the rate at which they come up whether the exposure has been correct or not. When a good trial strip has been obtained—that is, when it has received just so much exposure that about two minutes' development produces a bright image, it should be rinsed slightly and placed in the fixing-bath and the white light turned up for confirmation.

A full sheet can then be exposed, and if developed in the same developer for the same length of time, obviously an equally satisfactory print should result. Bromide prints, especially mattsurfaced ones, will dry slightly darker and duller than when wet, and if the negatives are not of the very best, a semi-matt surface will perhaps give the greatest satisfaction at first. When developing trials it is not a bad plan to examine the strip by transmitted light—that is, holding it up so that the light shines through the paper, when development is nearly done, and if the image looks as brilliant then as it does when seen flat in the dish, it may be taken as an indication that the exposure has been correct and that the print will be a bright one.

In enlarging, as in negative-making, correct exposure is more than half the battle. The rule is to expose so as just to get the lightest details to show with thorough development. If the negative be contrasted the same rule holds, but a dilute developer can be used; while for a flat negative a few drops of potassium bromide—say one drop to each ounce—10 per cent. solution will tend to correct this, but a longer development should be aimed at. "Trials" should be

made for every negative if real satisfaction is desired. Only those who are engaged in this work as a constant daily occupation can really dispense with this precaution, or those whose negatives are of remarkably even character.

The question of illumination differs as to details in each outfit, but the main points are similar. In a daylight enlarger or in one of those worked by reflected artificial lights, illumination is generally quite even if a good large surface (much larger than the negative) of reflector be provided and this must be dead white, not polished mirror or metal. Also direct light should not be allowed to reach the negative. In an enlarger fitted with a condenser the circumstances governing even illumination are somewhat more complicated. If the apparatus be set up in the dark-room with the lamp alight but with the front and lens removed a beam of light will be seen issuing from the condenser and converging more or less to a point. The distance of this point from the condenser can be varied by altering the distance of the light from the other side of the condenser. The smallest part of this cone of light should fall in the lens when in position, and as the lens has to be used at various distances according to the degree of enlargement, so also must the position of the light be altered accordingly. This movement is almost always provided for by a sliding arrangement to and fro, in addition to means for raising and lowering the light and moving it sideways.

A negative should be placed in the carrier, roughly focussed, and then removed. The lens should be stopped down slightly and the easel (which should be covered with a sheet of white paper) examined. It will then be easy to see if the lighting is even, and, if not, the light should be shifted, laterally or vertically, until the brightest part of the disk is central, and then the sliding movement brought into use until it is equally bright from center to margin. With some illuminants it is not easy to obtain a perfectly even effect with a small aperture in the lens. This can be remedied by a piece of fine ground-glass between the light and the condenser. In all up-to-date enlargers provision is made for this to be easily inserted or removed. Once the light is satisfactorily centered it should not be altered except when the rising or sliding front is used, and then the effect will be observed on examining the easel, but the sliding movement is brought into play every time any material alteration is made in the distance between the enlarger and the easel. Only by attention to the necessity of examining the illumination on the easel and adjusting the light accordingly can certain noticeable faults be prevented.

Coming now to the other troubles mentioned, blisters are caused by too great a difference in the temperatures of the various baths, especially between the fixing and the washing water. Hypo cools the water in which it is dissolved to a considerable extent, and in winter a little warm water should be added to counteract this.

White specks on matt or rough papers are due to minute air-bubbles, and show themselves when the developer is not flowed over in an even, unbroken sweep. This takes a little practice in sizes over whole-plate, so at first the print should

be soaked in plain water for a minute before development, and the trouble will then never occur.

A doubled image may be caused in two ways. One way is by vibration, either by touching the apparatus, or by walking about heavily during exposure. The other cause of this defect may be that the yellow glass cap is of a light tint and allows the image to print faintly at a slight distance from the actual white image. The glass of the cap should be of a deep rich orange to prevent this occurring with a powerful light source.—B. J.

Home-made Transparency Plates

THE suggestion by Mr. C. W. Thomas, that photographers and amateurs should themselves prepare their plates for transparencies, is one that in these times of inflated prices should meet with ready acceptance, especially by those possessed of the old experimental spirit, but, unfortunately, no full working formulæ were supplied.

I beg, therefore, to offer a formula which was published in the *Photographic News* in 1855, and which yielded transparencies of good quality, reminding one of the clear shadows of wet collodion. The formula was based on the original plan of Gaudin and Maddox, without washing, as it was intended for beginners in emulsion making.

The only real difficulty is the provision of a suitable place for drying. If the photographer is in the habit of backing his plates, he will, of course, have a suitable drying cupboard. If not, a cupboard in a dark-room may be utilized by placing a bottle of hot water in the lower part, say a foot or so below where the plate-rack is to stand, and hanging a piece of dark material inside from the top to the bottom, and close to the sides. The cupboard door may be opened occasionally to change the air when the room door and window are closed.

The formula is as follows:

Gelatin	60 gr.
Potass bromide	45 gr.
Water	2½ oz.

Any good clean gelatin would probably serve. That which I generally used was sold in pound packets for confectionery purposes, at about 2s. per pound. Put the gelatin to soak in the water half an hour or so before melting. Heat to 130° F., and dissolve gelatin and bromide.

Then stir in

Silver nitrate	60 gr.
Distilled water	3 oz.

at about the same temperature. Heat to 150° F., and keep at that temperature for two hours. Then add

Gelatin	1 oz.
Water	15 oz.

The gelatin should be well swelled in the water and then melted at 150°, mixed, and well shaken

with the emulsion. Add methylated spirit, 2 oz., and finally $1\frac{1}{2}$ drs. of a solution of

Water	1 oz.
Chrome alum	12 gr.

If the methylated spirit should be found to fog the emulsion pure alcohol should be substituted for it. These two solutions should be of the same temperature as the emulsion, secured by standing bottles of them in the water of the boiler or basin in which the emulsion jar is standing, and are added little by little, with constant stirring or shaking. The finished emulsion should be strained, while hot, through fine muslin, nainsook, or lawn.

For coating, the emulsion should not be warmer than is necessary for it to flow smoothly over the cold plates, nor should it be kept long in the liquid state, or the plates will not be uniform in speed, and may not retain the clearness of their shadow. The plates, as coated, are laid on a levelled cold slab until the emulsion has set firmly enough for them to be put upright—not too close together—in a plate-rack to dry. As chilling slab, the glass from a large printing frame may be used. Wedges under two corners of one side and under the middle of the opposite edge are adjusted with the aid of a spirit level, so that the slab of glass is itself level.

It is not suggested that plates of this character could take the place of rapid commercial plates for studio or general use, but for transparencies, and probably for most copying work, they should prove useful. In the matter of expense, as most photographers have plenty of waste negatives that could be washed off, the cost would come out at about a halfpenny for a half-plate.

A convenient pourer for coating plates is one introduced to me by Mr. W. B. Bolton, and a leader in bromide emulsion work. It is a small Japanese teapot, with earthenware strainer, into which surplus emulsion from the coating is poured. A piece of nainsook or muslin is placed on the opening for the lid, and the earthenware strainer forced down into place.

Pyro, generally with ammonia, was the developer in use at the time, but I see no reason why the modern developers should not do very well. Mr. Matthew Whiting, expressed himself as highly pleased with the plates, and mentioned that he used his favorite potash developer for them. The developer that I used, so far as I remember, contained equal parts of pyro and bromide of potassium. I think it was 1 grain of each, and 3 minims of ammonia to the ounce.

The plates, for the best effect (as for other purposes), should be backed. The original formula for caramel, gum, and burnt sienna answers very well, and for more speedy drying the addition of a little methylated spirit, as recommended by Mr. A. Haddon, is useful.—W. E. DEBENHAM, in *B. J.*

Dirt in the Dark-Room

A VERY large proportion of the questions addressed to us relate to troubles evidently caused by dirt; that is, by dust in the dark-room or dirt in the solutions or by the use of dirty

dishes or measures. From what we have seen of various dark-rooms and from what we know of the care necessary to avoid dirt, we can feel no surprise. Very often measures and dishes are left uncleared at the end of the day's work, simply because no conveniences exist for cleaning them. There is no scrubbing brush for the dishes, no mop for the measures, and often no rack where dishes can be set to drain. All these provisions should be made, while it should be a rule that all dishes must be thoroughly cleaned when done with, and Sapolio or Monkey soap should be provided for this purpose. A special shelf over the sink should be devoted to the draining of measures, beakers, etc., all of which should be left to drain upside down. For cleaning them we have found the most useful thing to be a pair of ordinary wooden glove stretchers, used to hold a sponge gripped between the ends. Bits of sponge of various sizes should be preserved for the purpose, and the stretchers will be found just as useful for small measures as for large wide-mouthed bottles. A few large sponges should always be at hand also, for nothing is better than a damp sponge for wiping down a bench top or shelf.—*B. J.*

The Stereoscopic Photography of Small Objects

THE art of stereoscopic photography, as usually practised, consists (*a*) in the translation, by means of suitable optical apparatus, of a three-dimensional real object into two two-dimensional images in the same plane, and differing from each other by a certain carefully determined parallax, and (*b*) in the presentation of these images to the eyes, with or without the aid of another optical apparatus, in such a manner that they are again resolved, and retranslated into a three-dimensional visual image similar to the original. This three-dimensional image may conveniently be called the stereoscopic image, as distinct from the stereoscopic negatives, photographs or prints which are used in its formation. The two branches of the subject are of equal importance, and cannot be dealt with separately.

A. The first essential in accurate stereoscopic work is that the image formed, whether it be equal to, larger than, or smaller than the original object, should be perfectly proportioned in all its three dimensions, so that the shape of the original may be exactly reproduced, without any deformation or change.

To secure this, three conditions, and three conditions only, which are universally applicable to every branch of stereoscopic work, must be fulfilled:

1. The axes of the lenses employed in taking the negatives must be parallel.

2. The optical centers of the two photographs, as presented to the eyes (not necessarily as mounted), must be at a distance apart equal to that separating the two eyes of the observer, and exactly opposite the eyes, so that the lines connecting these centers with the eye pupils may be parallel and at right angles to the plane of the eyes.

The optical center of a photograph is the point at which the axis of the taking lens intercepts the plane of the negative. These are fixed

points in stereoscopic work; and no matter what subsequent magnification or manipulation is adopted they must remain at the fixed separation just stated. The fulfilment of this condition, even approximately, is one of the most difficult problems, and in ordinary work one of the most tedious, that we have to face.

3. The prints or transparencies, as viewed, must subtend the same angle at the eye-pupils as the original object subtended at the centers of the taking lenses.

B. *Size and Distance of Stereoscopic Image.* The size (linear dimensions) and distance of the image are to a certain extent inter-connected, in that it will be convenient to decide on both beforehand and arrange to secure the required result; but any size and any distance can be obtained as the subject demands. In actual working, therefore, they are independently determined.

4. *Size of Image.* The size of the image relatively to the original depends altogether on the distance of the lens axes from each other when taking the photograph. If the image is to be actual size, the separation of the lens axes must be equal to that between the eyes of the observer; if greater, the lenses must be closer together; if less, they must be more widely separated.

The linear dimensions of the image stereoscopically seen vary with strict exactness inversely in proportion to the lens separation. This is the dominating fact in stereoscopic work.

5. *Distance of Image.* It having been determined that the image is to be at a certain distance and of certain size, the distance at which the object must be placed from the lens centers is found as follows: For an image of natural size, the object distance must be the same as that required in the image. For an image twice natural size, the object distance must be half that required.

In general: *For any given distance of the stereoscopic image the distance of the object from the lenses varies with strict exactness inversely in proportion to the scale on which the object is to be reproduced, or (see 4) directly as the lens separation.*

By "distance" is meant the distance between some given plane of the image or object and the plane of the eyes or the lens centers. In the photography of small objects it will be very desirable to take the background or support on which the object rests as the plane of reference. The bioptic parallax will then throw the image into relief against this plane.

Here it must be insisted on that the effect of size and position secured by the application of these rules is not an illusion or mere mental impression. The size of the image is not an apparent size; it is real. The position of the image is not an apparent position; it is a real position to which the image is projected by the perfectly normal action of the visual faculty. The mind has merely to receive and identify the data presented to it by the eyes and interpret them as experience has taught. In viewing the stereoscopic image, it is true that the eyes are focussed on a plane surface, and accommodation is not therefore called into action or completely correlated as it is in nature; but this unavoidable

defect is not sufficient to disturb or confuse the mental judgment, or, when properly viewed, to produce eyestrain. Incorrect mounting of the prints and general want of precision in the work undoubtedly do produce intense fatigue in the eyes after some time.

C. *Effect of Focal Length, etc., upon the Stereoscopic Image.* The focal length of the taking lenses, the camera extension, and the scale of the negatives do not constitute three separate factors in the problem, but only one. The focal length determines the camera extension in any given case, and the camera extension determines the scale of the negative. None of these elements has any decisive influence whatever upon the size or position of the stereoscopic image or on the correctness of its perspective. The camera extension merely determines the correct distance of the eye from the plane in which the prints are mounted, if the latter are made directly from the negative, so that condition 3 may be fulfilled.

The choice of focal length is therefore entirely a matter of convenience, determined partly by the limits of optical possibility of each lens, partly by the apparatus in use, and partly by the desire to avoid subsequent alteration of scale before printing.

D. *Result of Magnification or Reduction of Negative Image.* This is nil, provided the resulting prints are viewed from a correspondingly greater or less distance, so that they still subtend the proper angle at the eye.

If, however, a magnified pair of stereoscopic prints is viewed from the distance of the original camera extension, *i. e.*, at too great an angle, the stereoscopic image will be brought nearer and at the same time will be foreshortened or flattened in depth. The linear dimensions will remain unaffected in planes parallel to the prints, but in planes perpendicular to the prints they will be reduced exactly in proportion to the degree of the magnification. It is extraordinarily difficult to detect this distortion, especially when the field of view is narrow and the depth of the field not great; but that is perhaps all the more reason why it should be avoided. It must be noted that no real magnification of the image is secured, but only a closer view, which in many cases could be otherwise obtained without any sacrifice of accuracy.

When a reduced pair of prints is viewed from too great a distance the reverse to the above takes place. The image is seen further off and its depth is exaggerated.

We now come to some considerations affecting the finished prints themselves. For the sake of clearness, a pair of prints ready for viewing will be called a stereoscopic slide.

E. *Method of Viewing Prints.* Before a stereoscopic slide can be prepared it is necessary to know at what distance it will be held from the eyes of the observer, in order that the correct angle of view may be maintained. If it is to be looked at without the aid of a stereoscope it will naturally be held at "the distance of distinct vision," which in practice may be standardized as 12 inches, and the size of the prints must be made to conform to a camera extension of that length. If, on the other hand, it is to be viewed through a stereoscope, the slide will be

placed approximately in the focal plane of the viewing lenses, and the size of the prints must be reduced accordingly. Suppose, for instance, the original camera extension of the taking apparatus to have been 8 inches. If the slide is to be examined directly at a distance of 12 inches from the eyes the negative must be enlarged $1\frac{1}{2}$ diameters. If it is to be viewed through a stereoscope with lenses of 4-inch focus the negative scale must be reduced 2 diameters. The two slides will produce identically the same effect, but the scale of the two will differ by no less than 3 diameters.

F. *Effect of the Distance of the Stereoscopic Image upon the Process of Preparing Slides.* The distance at which the image of small objects would appear most natural is that at which the object itself would be examined if held in the hand of the observer. In this form stereoscopy reaches its highest point of perfection, as the focussing and converging accommodation of the eyes are almost exactly coördinated. Unfortunately, however, a most interesting problem arises here when it is proposed to view the slide without a stereoscope. For the plane of the mount itself will also be held at the same distance, and will coincide with the reference plane of the image. In other words, the right and left hand elements will have to be accurately superimposed upon each other on the mount by means of the selective two-color process already known, and viewed through corresponding light-filters. Or the two must be mounted side by side and shifted laterally by means of prisms or double reflecting surfaces until they optically coincide. This latter plan, involving the use of an optical apparatus, would quite annul the advantage of dispensing with an ordinary stereoscope, and would entail an inconvenient width of slide.

The two-color process referred to is one of great attractiveness, but it is very imperfectly developed. It would be of the greatest importance for the illustration of scientific books, and even of jewellers' catalogues, etc. It would allow of very large subjects, such as a group of entomological specimens, to be photographed and viewed together. There would be no secondary flat images at the right and left of the stereoscopic image to disturb the sense of reality. It could be impressed, with perfect success, on the pages of a book, in the same way as ordinary color printing. It certainly offers a most useful and promising field of investigation to specialists in transparent color inks and light-filters. Some albums of stereoscopic prints made on this method were published in Germany twelve or fifteen years ago, and were fairly satisfactory, but they were of the ordinary landscape kind which is particularly unsuitable. The only example at present in the writer's possession—a postcard—is thoroughly bad.

Failing the adoption of this process, it will be necessary to print the right and left-hand elements on a scale equivalent to a camera extension of 4 in. or 3 in., and to use a stereoscope with lenses of 4-in. or 3-in. focus in viewing. This will allow subjects of moderate width of field to be printed side by side without overlapping.

G. *Problem of the Correct Spacing of the Optical Centers.* When full-scale flat images are

made, and the super-imposed process adopted, this problem disappears. In the right and left-hand elements, the images of the reference plane of the object will in this case have no parallax relatively to the mount or to each other, and must be accurately registered in exact coincidence. This makes it important that, as already suggested, the flat background on which the object rests should be taken as "object distance," and it should preferably have a clearly defined border or other markings to facilitate registration of the color blocks. The optical centers will then automatically assume their correct position.

When small scale slides are made for use in a stereoscope the following method may be employed.

On the rebates of the stereoscopic negative, or on some part of the film which will not appear on the slide, and not far from the inner edge of one of the pair of images, mark the two ends of a vertical line. On the rebates of the other image mark similarly the ends of another line parallel to the first and at a distance from it exactly equal to the lens separation used. If the negative is printed from direct, the prints, having been reversed from right to left, must be mounted with the images of these lines eye-distance apart. The separation of the optical centers will then be correct. This does not quite obviate trouble, as the marks will have to be trimmed away before mounting, unless they are left on and subsequently masked out.

A better way is to use a copying apparatus fitted with two twin lenses on a sliding panel, the lenses being also separately mounted on sliding panels capable of fine adjustment from the side. Having adjusted the extension between negative, copying lenses, and focussing screen to give a sharp copy on the required scale, the lenses are moved relatively to each other until the vertical marks on the rebates appear eye-separation apart on the screen. A print or transparency may then be made having the two images reversed, in correct position for viewing, and with the optical centers properly spaced.

This method can only be adopted for making the small scale slides already referred to adapted for use in a stereoscope. If the scale is too large, the images on the focussing screen will overlap. If the scale is the full size of the required stereoscopic image the two will coincide and be super-imposed.

Another method of correctly spacing the prints is described in Section H below.

H. *Width of Stereoscopic Image.* It is of the utmost importance to the practical worker, in order that he may not attempt what will prove to be impossible, that he should know the extreme width of the stereoscopic image obtainable under any given viewing conditions, or, in other words, the extreme width of print that will not involve overlapping if the slide is to be examined in a 4-in. or 3-in. stereoscope. (The height of the image does not enter into the problems dealt with here, as this is determined solely by the covering power of the stereoscope lenses, and by the general inconvenience of looking at objects at such an angle that the eyes are unduly elevated or depressed from the horizontal.)

The following considerations give a simple way of arriving at these important facts, and they also suggest an alternative method of correctly spacing the prints by direct calculation based on the distance of the stereoscopic image.

When the eyes converge upon any two corresponding points of the right and left-hand elements of the slide, the lines of convergence meet in a point of the stereoscopic image, and this point of meeting determines the distance of the image at this point from the plane of the eyes. If now we imagine for a moment the image to be a real object, and the slide to be merely a transparent plane capable of being moved to and fro between the eyes and the object, it is clear that these converging lines, from eyes to object, will cut the plane in points which increase their distance from each other as the plane approaches the eyes, and draw nearer together as the plane is moved in the opposite direction; until, when the plane touches the object, the two points will coincide. This last is the condition which necessitates the super-imposing of the right and left-hand elements. At any given distance of the plane from the eyes, the separation of corresponding points gives the extreme width of print possible without overlapping; and it also obviously gives the correct distance at which corresponding points of the right and left-hand prints should be mounted.

This distance, and its result upon the limitation of the stereoscopic image, can easily be calculated. For if the slide is to be viewed at 4 in. from the eyes (in a 4-in. stereoscope), and the plane of the image is to be 12 in. distant, then the separation of corresponding points will be 8-12 of eye-separation, or 1.5 in. Taking, therefore, the flat background, with well-defined border line, as "object distance," it will only be necessary to trim the prints to shape and mount them with the images of this border line 1.5 in. apart to secure exact spacing. Again, since the slide is 4 in. from the eye, and the image 12 in., the scale of the prints will be one-third that of the image, and the extreme width possible to an image at a distance of 12 in. seen through a 4-in. stereoscope is therefore $3 \times 1\frac{1}{2}$ in., or $4\frac{1}{2}$ in.

An important advantage attaches to the use of a 3-in. stereoscope. In this case, taking image distance as before, the separation of corresponding points in the prints will be 9-12 of eye distance, or 1.69 in.; the scale of the prints will be reduced to one-quarter that of image, and the latter can have an extreme width of 6.75 in., or half as much again as that possible with a 4-in. stereoscope.

In each case, as a slight separation should be left between the inner edges of the two prints on the slide, the actual width of print and of image will be somewhat less than the extreme width indicated.

The advantage of the shorter focus stereoscope remains when the stereoscopic image is to be distant at more than 12 in. from the eyes. For instance, a butterfly of 12-in. wing-spread can easily be reproduced natural size at 2 ft. distance with a 3-in. stereoscope. The extreme width of print, or separation of corresponding points, will in this case be seven-eighth eye-separation (taken as 2.33 in. at 2 ft.), or 2.04 in., and the

extreme width of the image will be eight times this, or something over 16 in.

In general, if D represents image distance, d distance of slide from the eyes (focus of stereoscope), and S eye-separation, then: Separation of corresponding points on slide = $\frac{D-d}{D} S$.

$$\text{Extreme width of image} = \frac{D-d}{d} S.$$

If the copying apparatus described in section G is used for making the slides, the images on the focussing screen may simply be adjusted until corresponding points are covered by the ends of a compass set at the correct distance apart as calculated. The rebate marks on the negative are then unnecessary, but might be used as a second test of accuracy.

The image distance must be calculated with reference to some given reference plane in the object, and the corresponding points of the slide whose separation is measured must lie on the images of this reference plane; they must not be taken at random from other planes, as the separation varies for each plane.

The eye-separation, which varies with convergence, must be estimated from the distance of the image, *not* from that of the object photographed. The writer is not competent to give exact average figures, but workers are referred to the very instructive letter on the subject which appeared in the correspondence column of this journal on December 19 of last year. The "personal equation," or difference of individual eye-separation from the normal, will always remain to give a little uncertainty to the result; but, unless in very extreme cases, its effects will be inappreciable.

Two optical tables may be added here. The first illustrates the simple relationship that exists between lens-separation, size and distance of stereoscopic image, and distance of object from the taking lenses. The second gives some examples of the way in which the negatives may be obtained.

TABLE I

Lens-separation as compared with eye-separation	4	2	1	$\frac{1}{2}$	$\frac{1}{4}$	$\frac{1}{x}$
Size of stereoscopic image as compared with object	$\frac{1}{4}$	$\frac{1}{2}$	1	2	4	x
Distance of image as compared with that of object	$\frac{1}{4}$	$\frac{1}{2}$	1	2	4	x

TABLE II

		Measurements in inches.				
Distance of stereoscopic image . . .	12	12	12	12	12	
Size of image compared with object	1	2	3	4	10	
Distance of object from lens . . .	12	6	4	3	1.2	
Focal length of lenses . . .	6	4	3	2.4	1	
Lens-separation . . .	2.25	1.12	0.75	0.56	0.225	
Camera extension . . .	12	12	12	12	6	

(The eye-separation in viewing near objects probably does not average more than 2.25 in.)

In Table II the standard distance of 12 in. is adopted for the stereoscopic image, and a fixed camera extension of 12 in. is secured in the first four examples, the results being thus directly adapted for the superimposed process. Since the image distance and camera extension are the same, the size of the negative image should be identical with that of the required stereoscopic image, as given in the second line of the table. The fact that this is so in the examples before us is pleasing evidence that the conclusions arrived at in this article do not lead us astray. The example on the extreme right shows how a magnification of 10 diameters may be secured, retaining the position of the image at the required standard distance of 12 in.—H. C. BROWNE, in *B. J.*

Detecting Pinholes in Camera Bellows

WHEN a camera, either of the field or studio pattern, "springs a leak" most assistants I find start to locate the trouble by turning back the focussing screen, burying the head in the focussing cloth, and endeavoring to discover where light is getting into the camera. But a much easier method is to work the other way about, that is to put an electric light bulb inside the camera and then, in a darkroom, examine the outside of the apparatus for any escaping ray of light. The lamp can be conveniently fixed in the camera by cutting a piece of cardboard to slide into the grooves for the dark-slide and cutting in this a slit through which a plug to fit an ordinary electric lamp holder can be passed. This excludes practically the whole of the light, but the focussing cloth can be thrown over as well to make certain of the complete exclusion of light from the room. If this is done the slightest escape of light from pinholes in the bellows or from the lens panels can be very quickly detected. Where electric supply is not available the same method can be carried out by using one of the small pocket electric battery lamps.—E. S. GWYER in *B. J.* of *P.*

Paper Negatives

As many of my readers doubtless know, paper was the material first used in the making of photographic negatives, and, strangely enough, after the glass collodion negative had firmly established itself and photographers had forgotten the difficulties of the paper negative, experimenters strove to resuscitate a flexible support for the sensitive coating. Of these, as everyone now knows, celluloid film is the only one which is as effective as a glass plate. In devoting a chapter to the making of paper negatives, I am far from suggesting that any negative of this kind is of usefulness in a regular way. The lesser sensitiveness of emulsion which is obtainable on paper, the grain of the paper itself, and the opacity of the finished negative are three positive drawbacks to the use in these days of gelatine emulsion on paper. Nevertheless, there are circumstances which can easily arise in the experience of any photographer where a paper negative answers the purpose as

well as one on glass, and where the slower speed and slight grain of a bromide or negative paper are of negligible importance. Photographers have often to undertake cheap copying work for which a paper negative answers quite satisfactorily, and at a cost of material which may be a third or a quarter that of glass plates. Therefore, some notes on the making of paper negatives may not be out of place in this series of chapters.

The Sensitive Paper

This much by way of apology; let me say that choice can be made between the negative papers specially made for negative work and one or other of the many varieties of bromide paper upon the market. One or two makers issue a negative paper the chief feature of which is the tough and fine character of the paper itself and the sensitiveness of the emulsion in comparison with the average speed of a bromide paper. On the other hand, such negative paper requires particularly careful handling in use, and this chiefly in the direction of avoiding bending or buckling it when handling it in the various baths. The paper can easily be kinked; with the result that the emulsion film is very liable to blister at the point of damage. Generally speaking, practical requirements which are satisfied by a paper negative will be equally satisfied by one made on bromide paper. This latter is preferably one of the glossy or semi-glossy kind, although among the extremely fine matt papers now on the market it is not difficult to pick out some which answers well for negatives. Naturally a thin paper requires to be chosen; the paper negative is opaque at the best, and though it can be rendered somewhat more transparent by oiling or waxing, either of these are messy processes, and to be avoided if possible. They are of doubtful value in reducing the grain of the negative, and any effect which they produce in increasing the speed of printing can just as easily be obtained by using a more powerful source of light when printing (as would usually be done) on bromide paper.

Exposure, Development, and Fixing

A paper negative, of course, requires to be exposed in dark slide of book form, being backed up against the rebate of the slide by a piece of stout card. By this means alone sheets up to half-plate, at least, can be readily obtained perfectly flat in the field of the lens. It must be borne in mind that, compared with modern high-speed plates, any bromide paper is quite slow, and exposures will require to be ten to twenty times those which would be given to the average extra-rapid plate.

In development the chief thing is to avoid too rapid development. The superficial image which is readily obtained on bromide paper is not of sufficient intensity for a paper negative. One requires to develop further, judging the result by examining the negative by light coming through the paper. Perhaps as good a developer as any is metol-hydroquinone of formula such as is generally used for bromide papers, but with an extra dose of bromide. Hydroquinone made up with carbonate of soda is another good

developer for this purpose, and pyro-soda can equally be used so long as a liberal proportion of sulphite is employed, say, five times the weight of the pyro in the stock solution.

As regards the fixing bath, this latter should preferably be one of the acid type, one of the best formulæ for which is hypo, 4 ozs., dissolved in 20 ozs. of water, with addition of $\frac{1}{2}$ oz. of potass. metabisulphite.

Printing

Little requires to be said on this head beyond the fact that the grain in the paper negative, which is always present to a greater or less extent, requires to be masked as far as possible in the print. For this reason it will not do to print from the negatives on glossy paper. The effect of the grain thus recorded on the glazed surface of the print is particularly objectionable, but a matt paper—even one without any positive coarseness of texture—serves effectively to mask this appearance. The exposure in printing requires, as I have said, to be considerably greater than that for a glass negative, but in these days of gaslight printing when bunches of lamps are regularly used for short exposures on this class of paper, the rapid taking off of bromide prints from paper negatives presents no difficulties. The opacity of the paper can, as I have said, be reduced by oiling or waxing. A number of methods for these processes have been recommended, among which, perhaps, the simplest is to apply with a brush a mixture of castor oil, 1 oz., and alcohol, 4 ozs., to the paper side of the negative, and allow a few hours for it to soak in, re-applying, if necessary, and then laying the print for a short time between blotters. Another method is to float the negative, film up, on paraffin or white beeswax kept fluid by standing the dish containing it in another of boiling water. For my own part, I prefer to dispense with these operations.

Enlarged Negatives

The advantage of bromide paper in negative making is particularly marked in preparing enlarged negatives. Here the convenience of being able to cut your paper according to the size of negative required, and at the same time to avoid the weight and cost of large glass negatives, is a very positive advantage. An earlier article in this series has dealt with the methods of making enlarged negatives through the intermediary of either a contact transparency or through one of the full size of the enlarged negative. Whichever of these is used, the bromide paper will often usefully serve for the making of the enlarged negative, particularly when the prints to be taken therefrom are to be made on a paper or by a process yielding somewhat coarsely textured prints. As regards gradation, the enlarged paper negative must be expected to yield results slightly inferior to those obtained on a dry-plate, but for many of the purposes of the enlarger the paper negative is capable of rendering satisfactory results.

—B. J.

Photographic Materials and Processes

Photographic sulphur toning. R. Namias. *Il Progressio Photographico*, July, 1914. *Bull. Soc. Franç. Phot.*, 1919, 6, 305. *Selenium toning process of Namias.* J. Dubreton. *Bull. Soc. Franç. Phot.*, 1919, 6, 306.

CRYSTALLIZED sodium sulphide (60 gms.) and selenium powder (3 gms.), in the commercial form of small brownish-black sticks, are heated together in a porcelain crucible, with thorough stirring. After cooling, the mass is treated with water (1 liter), a deep red transparent solution being obtained which keeps well in full stoppered bottles. This bath gives with bleached bromide prints a fine purple-brown tone similar to that of a gold-toned print-out paper, with no tendency to the disagreeable yellowish appearance often obtained with the usual sulphide toning methods. Pure whites are obtained unless too many prints are treated in one bath.

Light filters; Ultra-violet transparent —. A. Miethe and E. Stenger. *Z. wiss. Phot.*, 1919, 19, 57—68.

TARTRAZINE in solutions 1:1000—1:20,000 shows a maximum transparency from 300—308 μ in the most concentrated solution to 280—391 μ in the most dilute. Filter Yellow in the same concentrations has a maximum transparency 296—308 μ with the most concentrated solutions, which increases to 270—500 μ with the most dilute. Martius' Yellow in 1:1000 solution is transparent for wave lengths 321—330 μ and in 1:20,000 solution for 296—374 μ . Nitrosodimethylaniline is transparent in 1:90,000 solution over the range 299—365 μ . Fluorescein increases in transparency down to 260 μ with increasing dilution. Eosin in 1:1000 is transparent, 368—390 μ , and in 1:10,000, 271—470 μ . The quartz silver mirror is transparent over the range 308—330 μ with a 2 seconds exposure of an iron-carbon arc, while with 640 seconds exposure the transparency is over the range 302—388 μ .

Photographic development under tropical conditions.

A. J. Agnew. *Phot. J.*, 1920, 60, 120—122.

THE sensitive film, before development, is treated in a hardening solution containing formalin and a suitable salt (Eng. Pat. 128,377; this J., 1919, 602 A). The most useful salts are sodium acetate, borate, bicarbonate, chromate, citrate, oxalate, phosphate, sulphate, and tartrate; potassium and magnesium salts are not quite so effective, and ammonium salts are not generally suitable because of the possibility of the liberation of ammonia in development. The hardening process also reduces the rate of development and the tendency to fog, so that development is easier of control than is otherwise the case at high temperatures. Subsequent intensification and reduction processes are not interfered with. There has not been noticed any tendency to separation of the film from the glass after drying. No reticulation is produced after the hardening process, by considerable variation in the temperatures of developer, fixing bath, and washing water.



DEPENDABLE as Niagara's power! *Constant* as the ebb and flow of tide! *Unfailing* as the seasons' changes! Nature's laws are the bulwarks upon which man builds with complacent certainty the works of industry and commerce.

The highest attribute a first class photographic paper can possess is *Dependability, Constant Uniformity, Unfailing Adherence* to a *fixed* standard. Nothing better can be said of *Haloid* papers than that they *ARE Uniform, Constantly and Unfailingly*.

And the Uniformity of Haloid Quality Papers is dependent upon several things. Not *plant* alone, not *personnel* alone, important as both are; but along with these things is earnestness of purpose, sincerity of effort, unswerving determination to produce good goods with dependable and unfailing constancy.

THE HALOID COMPANY

New York City Office
225 Fifth Ave.

Rochester, N. Y.

Chicago Office
68 W. Washington St.

HALOID IMPERA is Pre-eminent as a fine Portrait Paper

LEARN ART-RETOUCHING BY MAIL
 Essentials in 6 lessons. Price \$10.00. Clarence C. French (Late of the Academy Julian, Paris). Address: Box 607, Kalamazoo, Mich.

**REDUCTION in the price of
 Platinotype and Palladio Papers**

SEND FOR NEW LIST

WILLIS & CLEMENTS - Philadelphia

FOR SALE Complete file Wilson's Photographic Magazine (Photographic Journal of America). Morrocco bound to 1908—Bargain—A. H., care Photographic Journal of America.

SPECIAL OFFER For sale, large size Dry Plates; guaranteed excellent quality at bargain price; 20 dozen 14 x 17; 40 dozen 12 x 20. If you use these sizes it will pay you to write at once. Box—Care Wilson's.

HARVEY EXPOSURE METERS

No 2 for Kodaks
 Graflex and
 All Cameras
 Exterior or
 Interior.
 \$2.00



MP for
 Motion Picture
 Cameras
 Exterior Work
 Only.
 \$2.00

Your Dealer or G.L. Harvey 105 So. Dearborn St. Chicago

SPL

Its that Luminous, Vibrating Quality that enables Pictorialists, Amateurs and Professionals to win prizes and honors by the use of

THE STRUSS PICTORIAL LENS

FREDERICK W. KEASBEY

Box 303, MORRISTOWN, N. J.

KALOGEN, a universal, concentrated liquid developer—just add water.

Seltona
 ETO

The printing medium which experience has shown gives the maximum of charm with the minimum of trouble. . . . A wide range of artistic effects with complete simplicity in working.

FIVE GRADES

This superb paper is made in five distinct and delightful grades.

MATTE SMOOTH, CREAM SMOOTH, ANTIQUE (white and cream) AND GLOSSY

J. L. LEWIS - 522 Sixth Ave., N. Y.

SOLE AGENT

**KODAKS CAMERAS
 LENSES**

NEW or USED—MODELS and STYLES to suit the individual and purpose, at the lowest prices. Secure a copy of our free

BARGAIN CATALOGUE

and convince yourself of the extraordinary values we offer. If you have a perplexing problem to decide relative to this line, our force of experienced men will gladly render assistance.

First-class merchandise—moderate prices and prompt service guaranteed

CENTRAL CAMERA CO.

124 South Wabash Ave.
 Dept. F-33, Chicago, Ill.

STOP!! LOOK!! Our New No. 20 Bargain List which is now ready is better than ever. We buy and sell all kinds of Cameras and Lenses. Imported Ica and Butcher cameras. Headquarters for Cyko Paper.

Write today for Free Copy

New York Camera Exchange, 104 Fulton St., N. Y.



**"The Little Speedster"
 Gilbert Electric Retoucher**

Speeds Up Retouching

Geo. G. Holloway says: "One of the best inventions that Photography has had the good fortune to meet with, most useful." Two Year Guarantee by Manufacturers.

GILBERT SUPPLY CO. Independence, Iowa
 U. S.—DEALERS EVERYWHERE—CANADA

Make Perfect Negatives

With perfect exposure (obtained with American Photography Exposure Tables) and the Thermo Development Chart, you can make a perfect negative every time. The chart costs 25 cents at dealers or

**AMERICAN PHOTOGRAPHY
 BOSTON, MASS.**

SAMPLE COPY OF MAGAZINE FREE

**WILKINSON'S
 PHOTO-ENGRAVING
 IN LINE AND HALF-TONE**

Photogravure; Photo-lithography in Line and Half-tone; Collotype and Heliotype and the Swelled Gelatine Method of Photo-engraving

ALL SIMPLY TAUGHT AND EXPLAINED

\$2.00, POSTPAID

EDWARD L. WILSON CO., Inc.
 122 EAST 25th ST. NEW YORK



THIS beautiful symbol stands for better photography—with less effort, with less failure, with less investment of time.

For this symbol typifies the years of striving and learning concentrated in the Bausch & Lomb institution.

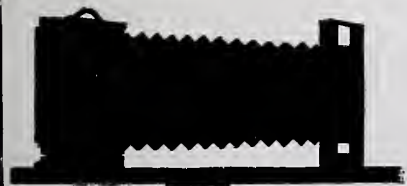
Tessar Anastigmat Lenses are the essence of the finest in lens manufacture, for they embody all the optical knowledge—the result of years of research—for which this organization is famous.

Every professional who exposes through Tessars works with the finest tools that can be made.

Bausch & Lomb Optical Co.

633 St. Paul Street Rochester, N. Y.
New York Washington Chicago San Francisco

Leading American Makers of Microscopes, Projection Lanterns (Balopticons), Photographic and Ophthalmic Lenses, Stereo-Prism Binoculars, Range Finders, Gun-Sights, Searchlight Projectors and other High-Grade Optical Products.



Bausch & Lomb

THE HOUSE THAT SHIPS PROMPTLY

“You cannot build good will up over night.”

—“*Printers' Ink.*”

They said a mouthful that time. No matter what your business it takes years of hard work, of promises made and fulfilled, of honest service, of careful manufacture of a first-class product, to build up true “good will.”

When it comes to good will, ask any of our customers his opinion of Gross Mountings and Prompt Service.



Imperial Plates



Brilliantly reproduces the image in a particularly fine-grained emulsion with an abundance of detail

A Plate for Every Purpose

Flashlights

For high-speed work; adapted to and used by the leading newspaper photographers in the U. S. A.

Non-Filter

For the true rendering of color values without a filter.

Orthochrome

For use with a ray-screen.

Special Sensitive

A fast plate for portraiture and focal plane work.

Ordinary

Especially adapted to "landscapes and seascapes."

Process

For black and white work.

Lantern (special)

The World's Standard Lantern Plates

At Your Dealer

G. GENNERT

American Agent

24-26 EAST THIRTEENTH STREET, NEW YORK

CHICAGO
320 South Wabash Ave.

LOS ANGELES
208 South Spring St.

SEATTLE
2102 First Ave.

SAN FRANCISCO
53 Fourth Street



Photo by McGeorge Taken by Cooper Hewitt Light

This is what the McGeorge Studio, Pittsburg, Pa., has written about Cooper Hewitt Light:

„I wish to say that I have used Cooper Hewitt Lamps for the last 10 years and am glad to say that the Cooper Hewitt 50-inch tube lamp is the best artificial light for making portraits and groups that I have ever used in my 20 years experience as photographer.

“I do not hesitate to recommend it, as I get as fine a negative as it is possible to make under the best skylight. I have at present an excellent skylight, but very seldom use it, for the reason that the daylight varies so much that it is very hard to get a good uniform grade of negatives.

“I am at present using three 50-inch tubes which give me excellent satisfaction, and are also everything that the Cooper Hewitt Electric Company say they are, ‘BETTER THAN DAYLIGHT.’”

Cooper Hewitt Light gives daylight results with artificial light. It is “better than daylight” because it is uniform and can always be depended upon.

Don't you need this kind of light for *your* studio?

Cooper Hewitt Electric Company

Boston—161 Summer Street
Chicago—618-9 Fisher Building
Cincinnati—First National Bank Bldg
Cleveland—Engineers' Building
Detroit—Ford Building
Hoboken—95 River Street



Los Angeles—Keese Engineering Corp.
Milwaukee—Security Building
Philadelphia—Drexel Building
Pittsburgh—Westinghouse Building
St. Louis—Central National Bank Bldg.
Syracuse—University Building

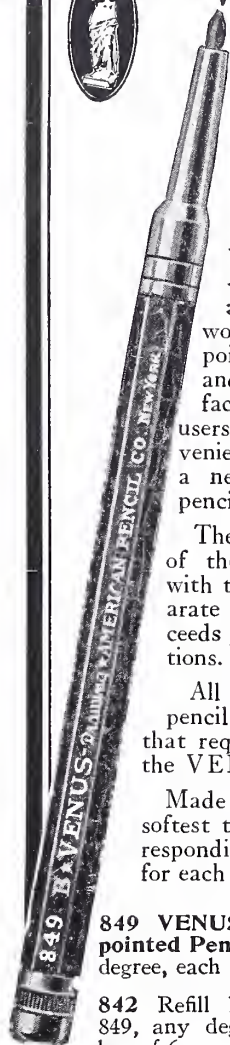
CH-20

When writing to advertisers kindly mention this Magazine

VENUS

EVER-POINTED PENCIL

N^o 849



MARVELOUS re-touching results are obtained with the wonderful VENUS Ever-pointed Pencil. Artists and photographers—in fact, all constant pencil users—find in this convenient, everpointed pencil a never-ending source of pencil luxury.

The comfort and economy of the matchless VENUS with the advantage of separate leads and holders exceeds your highest expectations.

All who want a perfect pencil of uniform length that requires no pointing use the VENUS Everpointed.

Made in 16 degrees, from 5B softest to 9H hardest—a correspondingly marked holder for each degree.

849 VENUS Ever-pointed Pencils, any degree, each . 40c.

842 Refill leads for 849, any degree, per box of 6 . . 60c.

At all stationers and stores throughout the world

American Lead Pencil Co.

235 Fifth Ave., Dept. H., N.Y.
and London, Eng.



*Do you Know,
if not you should,
that you can obtain*

Heliar Lenses

F 4.5

GENUINE—IMPORTED

9 $\frac{1}{2}$ in. Focus in barrel, \$175.00
14 $\frac{2}{5}$ in. Focus in barrel, \$275.00

G. GENNERT

24 EAST 13th ST., NEW YORK
Chicago San Francisco Los Angeles Seattle

**KEEP YOURSELF UP TO THE
MINUTE**

**READ ALL ADVERTISEMENTS
IN THIS ISSUE CARE-
FULLY**

**GET THE LATEST CATALOGS
AND SAMPLES OFFERED**



**And Don't Forget
To Mention This Magazine
When You Write**

For the Commercial or Industrial Photographer—7 x 11

A size that is different, looks bigger, sells better, is pleasing and that is specially suited to a great variety of subjects. The 7 x 11 materials cost no more than those used for 8 x 10 pictures.



Eastman View Camera No. 2 7 x 11

For either vertical or horizontal subjects. Is an improved model of the Century View and Empire State and embodies all their practical conveniences. The sliding front board permits the lens to be centered on either half of the film or plate when making two exposures on a 7 x 11.

Eastman View Camera No. 2, 7 x 11, with case
and one Portrait Film or Plate Holder, . . . \$63.18

EASTMAN KODAK COMPANY,
ROCHESTER, N. Y.

All Dealers'.

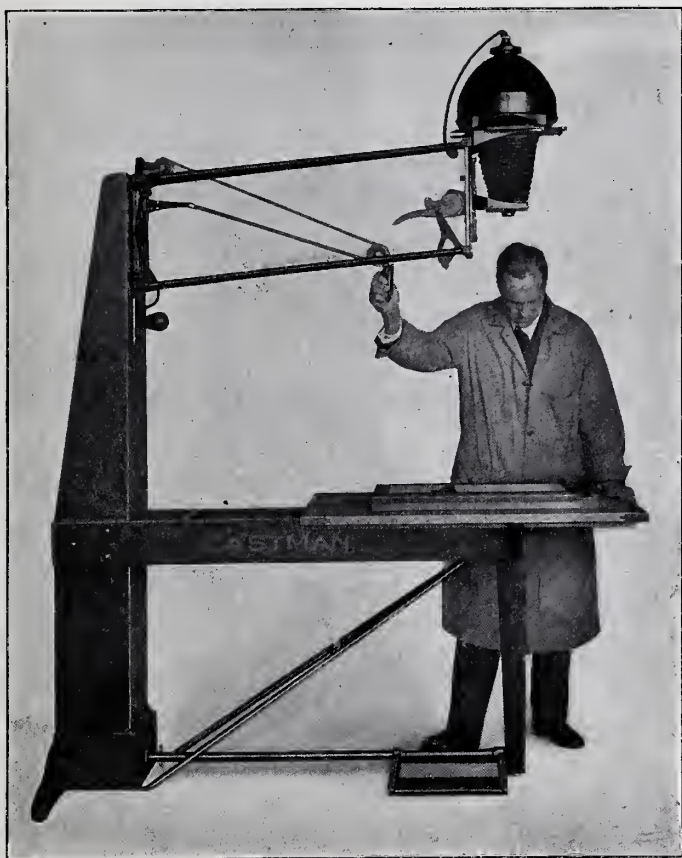
Confidence in Eastman Tested
Chemicals is confirmed by con-
tinual, practical proof of their
ability to produce results.

*It's good business to specify
E. K. Co. Tested.*



EASTMAN KODAK COMPANY,
ROCHESTER, N. Y.

All Dealers'.



The Eastman Projection Printer

Always in focus—always ready for an exposure. Enlarges from $1\frac{1}{2}$ to 8 diameters, from 5 x 7 and smaller negatives; capacity, 30 x 40 inch prints.

The only adjustment is for size of image,—raise or lower the camera—an automatic mechanism maintains a constantly accurate focus. Permits of greater accuracy and economy and more than double the speed of other enlarging apparatus.

Diffusing Disks give pleasing diffusion without increase of exposure.

The Eastman Projection Printer, complete with Eastman 5x7 Projection Anastigmat Lens f.8, $7\frac{1}{2}$ inch focus, set of three Diffusing Disks, Paper Holder, Sliding Table and 250-Watt Mazda Lamp, - - - \$450.00

EASTMAN KODAK COMPANY,
ROCHESTER, N. Y.

All Dealers'.

The Seed standard of quality has been maintained by the exceptional uniformity of the Seed product.

Seed plates produce negatives with the roundness, brilliancy and gradation that insure perfect print quality.

The Seed 30 combines extreme speed with the finest qualities of the ideal portrait plate.

It's a Seed Plate you need.

EASTMAN KODAK COMPANY,
ROCHESTER, N. Y.

All Dealers'.

Just say

ELON

You will get the developer
that gets results—and at
the right price.

We make it—we know it's right.

EASTMAN KODAK COMPANY,
ROCHESTER, N. Y.

All Dealers'.

EASTMAN PORTRAIT BROMIDE

Made specially for portrait enlarging—which means that it will reproduce the quality of the ideal portrait negative.

It has ample speed, the long scale of gradation which especially suits the portrait negative, and yields carbon-brown tones of distinctive richness with the ordinary re-development process.

Supplied in two colors and two surfaces.

D White, Rough Matte

E Buff, Rough Matte

D White, Rough Lustre

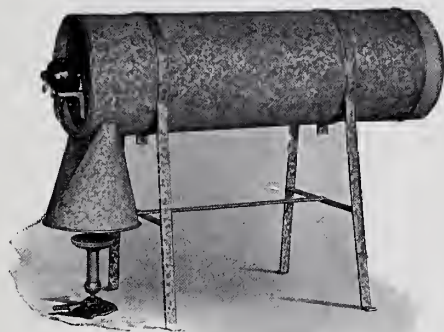
E Buff, Rough Lustre

At prices the same as for D. W. Artura Iris.

EASTMAN KODAK COMPANY,
ROCHESTER, N. Y.

All Dealers'.

*Dry prints too quickly and you lose quality—
dry them too slowly and you lose time.*



Prints dried in the

IMPROVED MAJESTIC PRINT DRYER

are properly shaped, bone dry, uninjured by heat and ready for delivery in twenty minutes. They may be delivered unmounted, loose mounted or in folders, and they keep their shape.

The No. 1 Dryer, a convenient size for the portrait studio, will dry from 1600 to 4000 prints in a day. It has two drying rolls, electric motor, fan, gas heater and stand. The price, complete, is \$45.00.

EASTMAN KODAK COMPANY,
ROCHESTER, N. Y.

All Dealers'.

To produce negatives free from halation, clogged highlights and degraded halftones—negatives that have gradation without flatness,—brilliancy without harshness, use

EASTMAN PORTRAIT FILM

EASTMAN KODAK COMPANY,
ROCHESTER, N. Y.

All Dealers'.